October 13, 1947

STEEL

The Magazine of Metalworking and Metalproducing

ESTABLISHED 1882

EDITORIAL INDEX, PAGE 47

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DETROIT

Where

MIGHT

is

RIGHT

Strength, wear resistance, rigidity and surface perfection . . . those are the demands you must satisfy. Ohio Steel can supply the RIGHT ROLLS for every type of rolling job.

Ohio Rolls

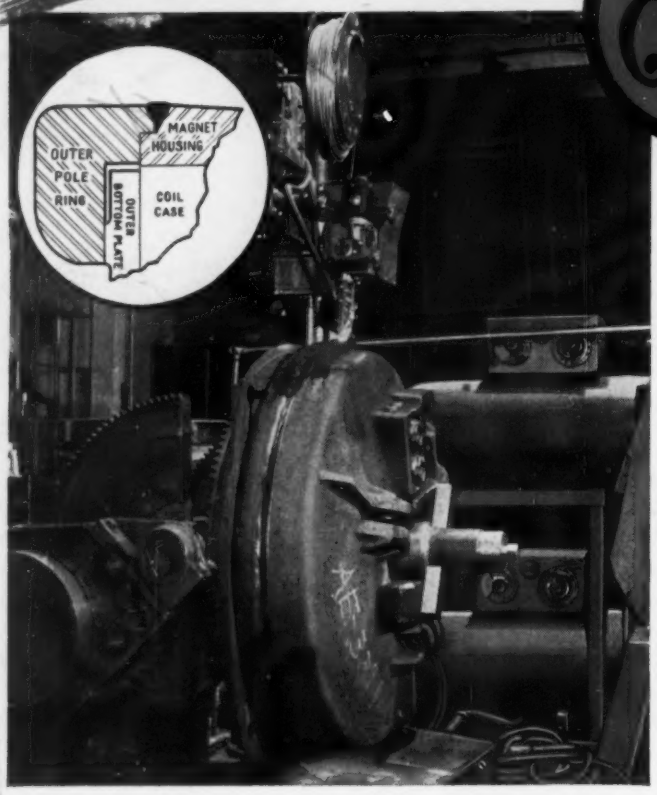
SHAPING METAL FOR ALL INDUSTRY

Select from any of those eleven types of Ohio Steel and Iron Rolls: Carbon Steel Rolls, Ohioloy Rolls, Ohioloy "S" Rolls, HOLL-O-CAST Rolls, Chilled Iron Rolls, Alloy Chilled Iron Rolls, Denso Iron Rolls, Nickel Grain Rolls, Special Iron Rolls, Nioloy Rolls, Flintite Rolls.

THE OHIO STEEL FOUNDRY COMPANY ★ LIMA, OHIO

Plants at Springfield and Lima, Ohio

Pole Shoes AUTOMATICALLY WELDED on EC&M Type SW ALL-WELDED MAGNETS



● Made by an automatic welding-head as the positioner-table rotates the magnet, the weld between outer pole shoe and magnet-housing is *strong*, *homogeneous*, and *ductile*. Furthermore, it is permanent and assures continuous high-lifting capacity.

Welding eliminates bolts that stretch, allowing rust, scale, and other foreign material to enter crevices, often making snug re-fit of pole shoes impossible; no recesses for bolt heads to interrupt the magnetic path. In these *all-welded* magnets, outer pole shoes and center shoe plates are permanently mated to magnet-housing by welding.

As proof of the superior lifting capacity of this advanced magnet-design, examine the installation views at right. These are busy, scrap-handling scenes. Note how the lifts completely fill the face of the magnet. Loose pieces also cling to the magnet-sides.

For complete description of this outstanding EC&M Type SW *All-Welded* Lifting Magnet, write for your copy of Bulletin 900.

THE ELECTRIC CONTROLLER & MANUFACTURING CO.

8600 E. 79th St. Cleveland 4, Ohio

TRANSMISSION TOWERS of MAYARI R

COST LESS TO MAINTAIN

There are sound reasons why Mayari R steel is being used to advantage in the construction of modern transmission towers.

1. Mayari R has 5 to 6 times the atmospheric corrosion-resistance of mild carbon steel and 2 to 4 times as much as copper-bearing steel. Towers made from Mayari R can be expected to give longer service, require fewer repairs and reduce power interruptions.

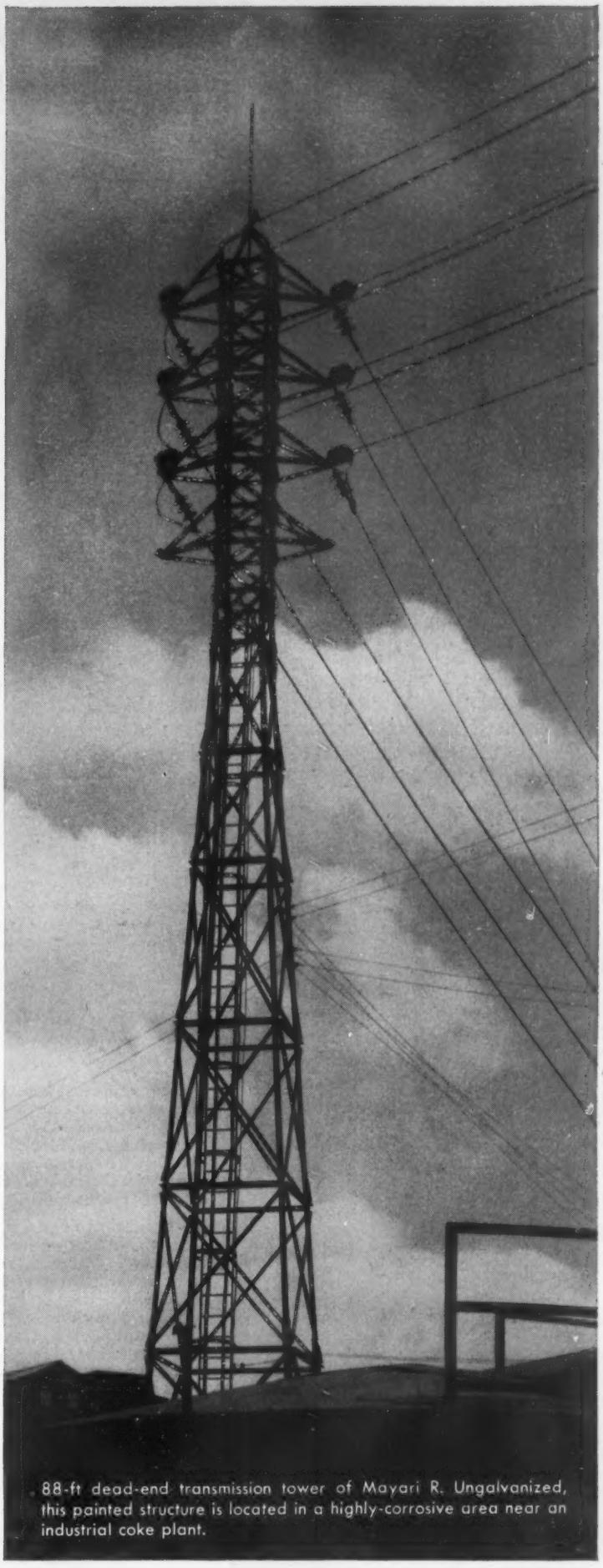
2. Under exposure to industrial atmosphere, tests show that Mayari R holds paint 20 to 80 pct longer than structural carbon steel. Mayari R towers require considerably less paint-maintenance, the extent of the saving depending on the climate and the type of primer used.

Mayari R supplies the answers to many important construction and maintenance problems. For more information on the properties and adaptability of this versatile steel, write the nearest Bethlehem office for Catalog 209.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by
Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

★ BETHLEHEM STEEL ★



88-ft dead-end transmission tower of Mayari R. Ungalvanized, this painted structure is located in a highly-corrosive area near an industrial coke plant.

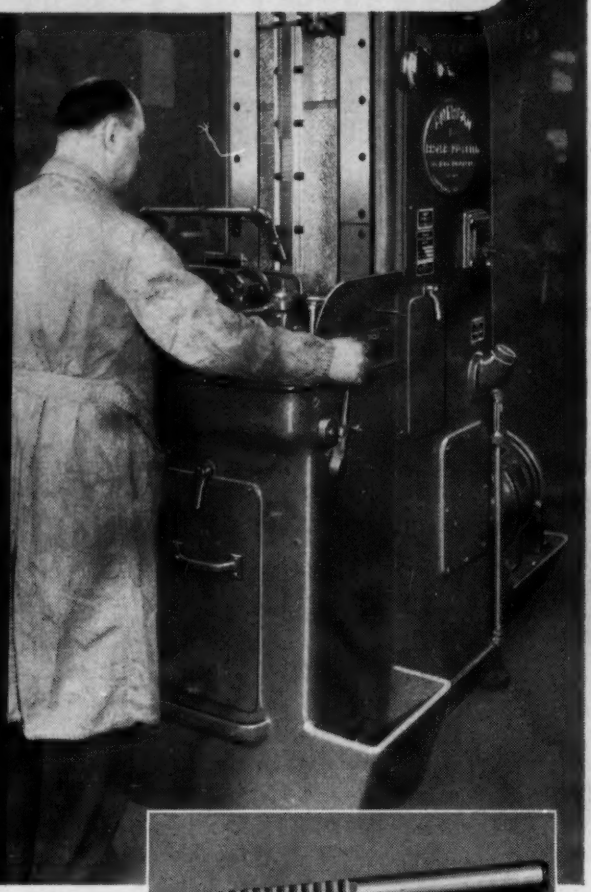
Mayari R *makes it lighter...stronger...longer lasting*

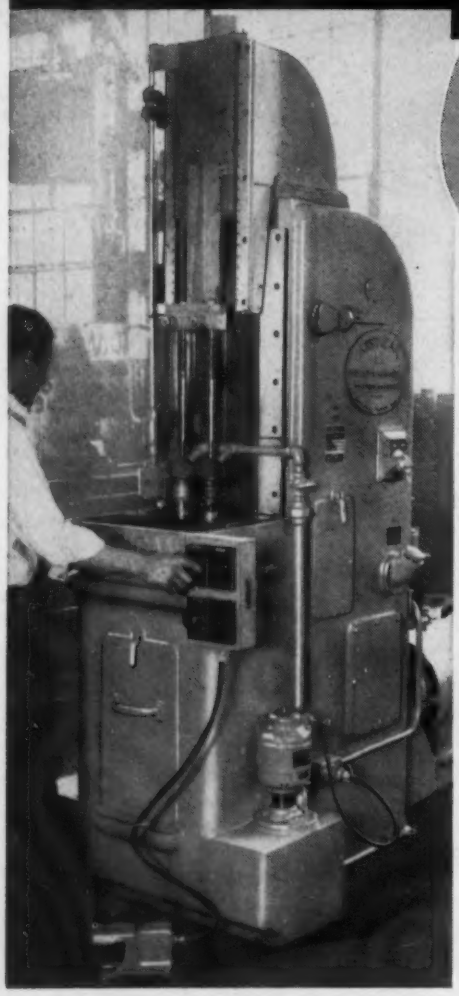
AN ALL-PURPOSE BROACHING MACHINE

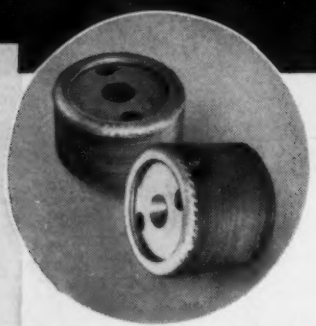
That's What You Get with *American's* 3-Way

A machine that gives you pull down, push down, and surface broaching; a machine that can be used for a wide variety of internal and surface broaching jobs—that's *American*'s exclusive 3-Way Vertical Hydraulic Broaching Machine. You can change over from one type of broaching operation to another quickly. It requires only replacement of fixture and broaches, and addition of pull head and lugs.

For all types of broaching machines, for all kinds and sizes of broaches, for tooling and fixture design based on more than a quarter century of broaching experience—look to *American*, the *one* source for all your broaching needs. For the best in broaching—machines, tools, and engineering—see *American* first!







To illustrate the wide variety of broaching jobs possible on this all-purpose machine, the Standard T-8-24 is pictured above.

This machine is operated by manual controls and the broach holders are mounted directly on the main machine slide. The operation is surface broaching the teeth in a round bar with the tooling designed to automatically clamp and eject the broached parts.

For broaching the holes in laminated commutator parts an *American* T-8-24 3-Way machine equipped with special broach retriever unit, foot switch, and electric controls was provided.

With the above extra equipment the operation is semi-automatic. Operator loads two parts and starts retriever unit, which lowers broach pilots through work into automatic quick connecting pull heads. Machine slide pulls broaches through work, operator unloads and starts return of machine slide by foot switch. At end of return stroke he loads two more pieces and begins cycle again.

★ ★ ★

A new circular tells the complete story of *American's* Type-T 3-Way broaching machine. A letter or post card will bring it to you by return mail. Write today for Circular 100.

American

BROACH AND MACHINE CO.

ANN ARBOR, MICHIGAN

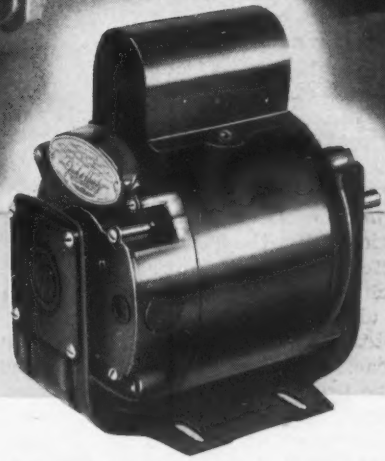
•

BROACHING MACHINES
PRESSES
BROACHING TOOLS
SPECIAL MACHINERY

DIVISION OF SUNDSTRAND MACHINE TOOL CO. ROCKFORD, ILLINOIS, U.S.A.

Birth of an iron grip

Powerful steel jaws automatically fix the stator in position and clamp the frame firmly against the lamination stack while the operator welds a life-long grip . . . the fastest and surest way to insure permanently quiet operation of all Jack & Heintz fractional horsepower electric motors.



Better electric motors through

JACK & HEINTZ

Mass Precision

JACK & HEINTZ PRECISION INDUSTRIES, INC., *Cleveland 1, Ohio*

Behind the Scenes...

Pheeble Ephorts

All the new type and equipment down in our printshop reminds us of an allegedly true story of a Western newspaper of the early days. This tale has been told before, and perhaps you've seen it, but it recently cropped up again in *Magazine Digest* so we're passing it along to you, as follows: "The Roccay Mountain Cyclone begins publication with some phew diphiculties in the way. The type phounders phrom whom we bought our outphit phor this printing ophphice phailed to supply us with any ephs or cays, and it will be phour or phive weeks bephore we can get any. We have ordered the missing letters and will have to get along without them until they come. We don't lique the loox ov that variety ov spelling any better than our readers, but mistax will happen in the best regulated phamilies, and iph the p's and c's and x's hold out we shall ceep the Cyclone whirling aphter a phasion until the sorts arrive. It's no joque to us --it's a serious aphair." Fortunately for us, the stuff arrived intact and the typesetters downstairs don't have to revise the spelling of the English language.

In Re: Readership

Every once in a while we get the urge to talk about our favorite subject—how you readers read STEEL and what the editors are doing to meet your needs and wishes. We've restrained ourselves for a long time now, so we just have to burst forth and talk about a letter we received the other day from the North American Manufacturing Co. Let's quote: "The North American Mfg. Co. has recently put into effect a magazine routing system which has met with the hearty approval of all of its employees. This plan promotes the exchange of ideas and helps each employee to keep in step with the times in his own phase of the business. By increasing readership of each copy of business papers, knowledge gained by our people benefits us all." The letter goes on to explain the routing system used, which is similar although more extensive than other plans in use in many companies. Our own readers service department is in the business of furnishing free to any subscriber prepasted, printed route slips to fasten to all your copies of STEEL so your copy can accomplish the same purpose as those at North American. If you're not now using our route slips for your copy, why don't you drop a line to the RSD and give them the names in the order you desire? They'll be happy to knock out some slips for you. STEEL is providing ideas and information worth thousands of dollars to many metalworking men, and we'd like to do the same for many more!

Puzzle Corner

Seems like that cow and grass problem was a little too tough, because the only letter which came in was one from a reader who couldn't solve it and wanted the answer so badly that he enclosed a stamped, self-addressed envelope. We hope he can now rest in peace—the answer has been sent to him. We had visions of sleepless nights and torn hair all over the industry after reading his letter, but apparently there haven't been any serious repercussions. No answers, either! The problem of nines was all too easy, as the volume of answers attests. The answers are, of course, (a) .999 (b) 9.99 (c) 999 (d) 9 9/9 (e) 99/9 (f) 9+9/9. Here's one which is a little tougher than the frog and well problem. A snail, lazy creature that he is, sleeps half his life away. This particular snail we're thinking about has a 20-foot wall to climb over, meaning that he has to climb up one side and down the other. He can climb three feet in a day, but he slides back two feet while he's sleeping. How many days does it take him to get to the bottom of the opposite side? We have to assume that he works as hard going down as he does going up!

Last Call for Index

Available now is the greatly expanded and improved index for the first half of 1947. We have tucked away a stack of copies and if you'd like one, drop us a note. We'll send it out posthaste for free. Contains the regular alphabetical index as well as the new topical index and some other features. Be happy to send you one!

Shrdlu

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STEEL

Vol. 121—No. 15 October 13, 1947

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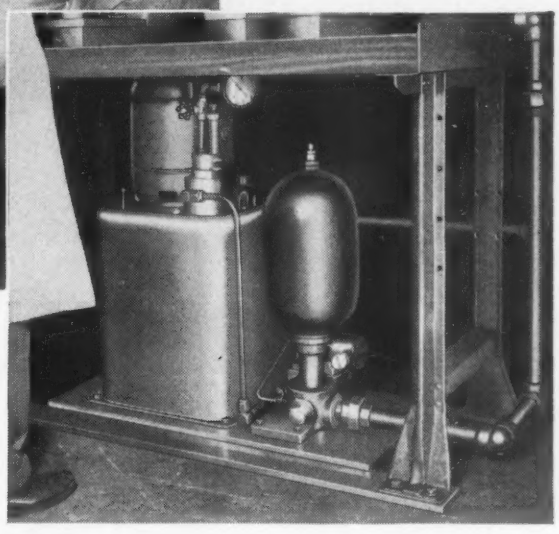
Editorial Staff on Contents Page

Produce Your Successive-Operation Jobs Faster with the MULTIPRESS MIDGET

All four of these Multipress Midgets are being operated by ONE pumping unit, shown below. Up to 12 Midgets may be used with one such unit—the ultimate in low initial and operation cost!



SPECIFICATIONS (basic unit)

Capacity (ram effort)	1 ton
Stroke	6"
Ram speed adjustable up to	400 ipm down—600 ipm up
Daylight	10" or 14"
Throat depth	5"
Base Plate tooling area (optional)	10"x10" (standard)
Dimensions	24¾" high x 17" deep x 18¼" wide
Weight without base plate	130 lbs.

When your manufacturing calls for successive operations on a part, multiple or "gang" installations of the MULTIPRESS MIDGET will give you increased production—*with low initial cost!* Up to 12 units may be used with a single, centralized power source, with each MIDGET having individual pressure adjustments from 200 to 2000 lbs.

All the production features of the famous MULTIPRESS are incorporated in the new MIDGET. Its Oil-smooth HydrOILic power offers you Vibratory repeat strokes, fast approach and slow pressing speeds, either dual hand lever or foot pedal safety controls—plus adjustable stroke length, ram speed and pressing effort. A wide variety of optional equipment can be furnished.

Write today for Bulletin M-15—it's filled with facts on this new addition to the MULTIPRESS *line.*

THE DENISON
ENGINEERING COMPANY
1163 DUBLIN ROAD
COLUMBUS 16, OHIO

DENISON EQUIPMENT for APPLIED HydrOILics

Signs that point the way to long life for painted metal surfaces

—made of REPUBLIC ELECTRO PAINTLOK

No matter what you make—signs, cabinets, ventilators, trailer bodies—if your product involves the application of paint on sheet steel, you should know more about Republic ELECTRO PAINTLOK.

This chemically-treated, zinc-coated sheet ends the old troublesome problem of securing *LASTING* paint adherence on a zinc coated surface.

It comes to you clean and in prime condition for painting. It does not rust in storage. It takes and *HOLDS* paint, lacquer and enamel indefinitely.

The zinc coating is so tight that it will stand as much fabrication as the base metal—without cracking, peeling, flaking or powdering. Should the paint film be damaged, the zinc coating protects against underfilm corrosion.

Now is the time to learn what Republic ELECTRO PAINTLOK can do for *your* present and future products. Write us.

REPUBLIC STEEL CORPORATION
GENERAL OFFICES • CLEVELAND 1, OHIO
Export Department: Chrysler Building, New York 17, New York

Republic Electro Zinc Plated Products include ELECTRO PAINTLOK and ELECTRO ZINCBOND in sheets and coiled strip, in various widths depending on gauge involved.

Republic
REPUBLIC STEEL
ELECTRO ZINC PLATED SHEETS
Electro Paintlok · Electro Zincbond

Other Republic Products include Carbon, Alloy and Stainless Steels—Sheets, Strip, Plates, Bars, Pipe, Tubing, Bolts and Nuts, Wire

CHECK THESE CRANE ADVANTAGES...

. . . BEFORE MAKING EQUIPMENT PLANS

Here they are: • Simplicity of design • Uniform Pressure Swing Clutches • Cushion Clutch • "Feather-Touch" Clutch Control • Dual Independent Shovel Crowd • Northwest Welded Boom • Northwest Worm Boom Hoist • Helical Gear Drive running in oil • Alloy Cast Steel Bases • All High Speed Shafts mounted on ball or roller bearings • Northwest Crane Booms with flange joints • Self-Cleaning Type Crawlers • Northwest Steering • Enclosed Crawler Gears • Easy Convertibility • Cast Steel Machinery Side Frames for rigidity.

These and other Northwest advantages assure you high output and long service—the kind of service all Northwest Owners are getting. Plan to follow the Northwest Crowd!

NORTHWEST ENGINEERING COMPANY
1508 Field Building, 135 South LaSalle Street, Chicago 3, Illinois

All cranes *are not alike*. Northwests bring you advantages that you should know about before you buy. Experienced Northwest users, who know other equipment as well, have found that Northwest advantages and design have meant the difference between trouble-free performance and ordinary performance.

Northwest Crawler Cranes will go anywhere, bringing you complete flexibility in yard arrangement without the cost of rail or overhead structures.

NORTHWEST

The Crane that goes Anywhere!

4 to 44 tons

Open hearth men —until

Previous claims that various bottom materials "can solve all your problems" would make any open hearth supervisor run for the ear stops and blinders.

Now, we don't make any such sweeping claim for *Permanente 84* . . .

BUT . . . we can *prove* the following statements:

Now you actually *can* produce more tons of ingot per hour—at lower cost per ton!

Now you actually *can* reduce down-time!

Now you actually *can* cut burn-in time way down . . . and still have a more rigid, highly refractory mass that will last and last and last at operating temperatures!

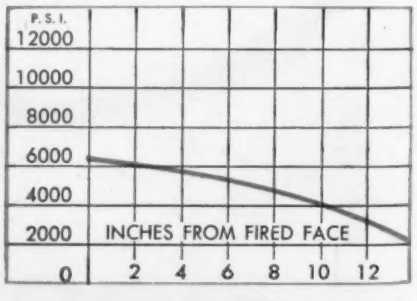
Permanente 84 is made up of periclase* grains . . . plus a unique new synthetic bonding medium.

Its periclase grain is formed by the high temperature fusion of exceptionally pure, magnesium oxide, fully shrunk and carefully sized for maximum density.

Most startling *Permanente 84* feature is its new bonding medium. Using no deleterious fluxes, it weds the periclase grains into a dense, crystalline magnesia-bearing mass. At only 2200°F. a deep, *fluid-free*, ceramic bond is formed with a melting point well above operating temperatures.

But that isn't all the eye-popping story of *Permanente 84* . . .

Look at these charts! They tell a story of more ingot tons per hour at a lower cost —which can be applied to *your* basic steel furnaces . . .



At 2200°F. a deep, through and through refractory bond is formed, not just a thin crust over loose or powdery material.

couldn't be blamed for this Permanente 84!

For this *different* periclase ramming material brings you all the advantages of other bottom materials . . . without their limitations.

Full bottom depth can be quickly rammed into place and airset, ready for burn-in. In a matter of HOURS—not days—it recrystallizes to form a monolithic mass of minimum porosity. Yet shrinkage is held to a new, barely measurable low, and thermal plasticity doesn't start until 2822°F.

Further, *Permanente 84* possesses a very high hot load strength . . . is extremely resistant to iron oxide penetration and to slag wash. And because of its unusually low lime content, it resists hydration to an exceptional degree.

Yes, for maintenance—for major repairs—for new bottom construction—*Permanente 84* periclase ramming material means *less* burn-in time—*longer* life. Two features never before brought together in a single bottom material!

We've got more proof of the startling superiority of *Permanente 84*—*plenty* of it. Simply call on a *Permanente 84* engineer for the complete facts.

* *Periclase* is the technical term for high-grade, dead-burned magnesite.

PERMANENTE 84

PERICLASE RAMMING MATERIAL

PERMANENTE PRODUCTS COMPANY, INDUSTRIAL DIVISION, KAISER BUILDING, OAKLAND 12, CALIFORNIA

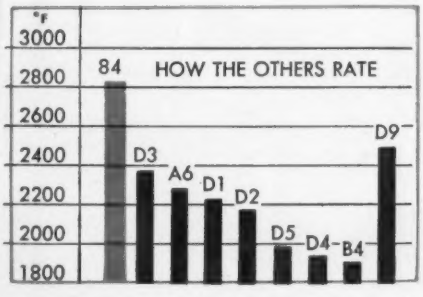
Eastern warehouse supply available

For immediate delivery in the East, call or write:

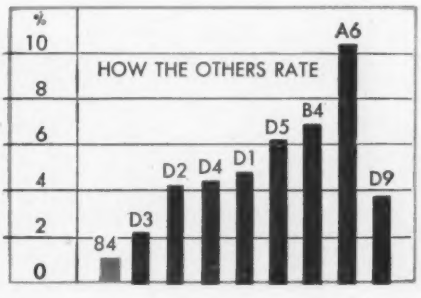
PERMANENTE PRODUCTS COMPANY
1712 First National Tower Bldg., Akron 8, Ohio. BLackstone 5518

For immediate delivery in the West, call or write:

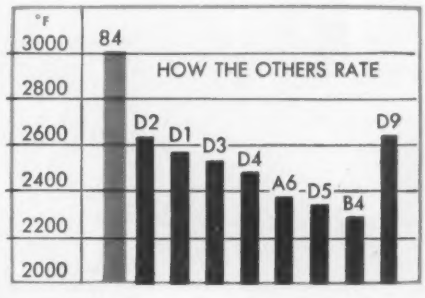
PERMANENTE PRODUCTS COMPANY
1924 Broadway, Oakland 12, California. TWinoaks 3-4600



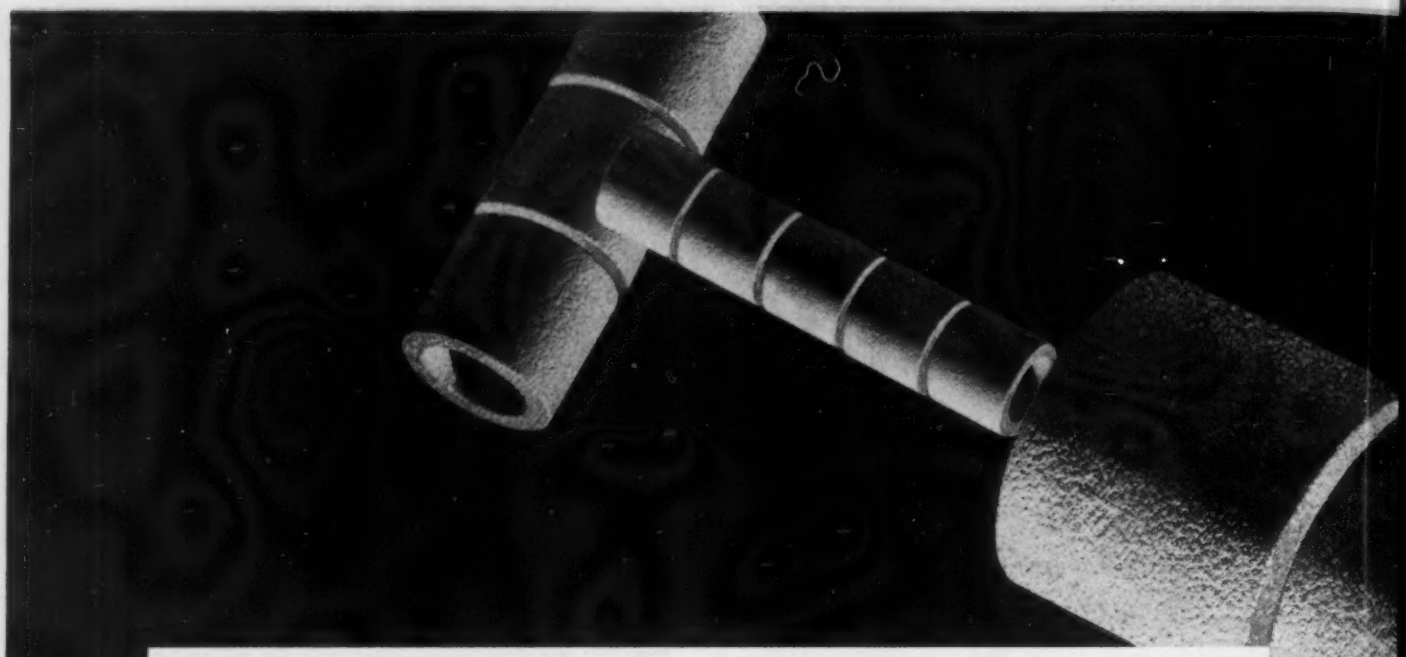
Under a load of 25 pounds per square inch, thermal plasticity of *Permanente 84* doesn't start until 2822°F.



And linear shrinkage has been proved less than 1% in test bars of *Permanente 84* fired at 3000°F.!



With *Permanente 84* failure by shear under 25 pounds per square inch will not occur under 3000°F.



Knock out the bugs in your grinding department

Bugs in your grinding department?

There may be—even though you don't suspect it!

Here's how to find out: call in Peninsular Engineers, specialists in grinding problems since 1889. They will study your grinding completely—your equipment, material to be ground, and all other factors that influence grinding costs.

Results learned will enable Peninsular to propose remedies to knock out any excess-cost grinding practices you now have. Whether your grinding operation is up-to-date or moth-eaten, chances are the Peninsular analysis will save you dollars.

Peninsular Engineers have been cutting production expenses substantially for 58 years right in your own industry.

The Peninsular Grinding Wheel Co., 729 Meldrum Ave., Detroit 7. *Sales Offices:* Chicago, Philadelphia, Boston, Buffalo, Cleveland, Pittsburgh, Houston, St. Louis, Cincinnati.

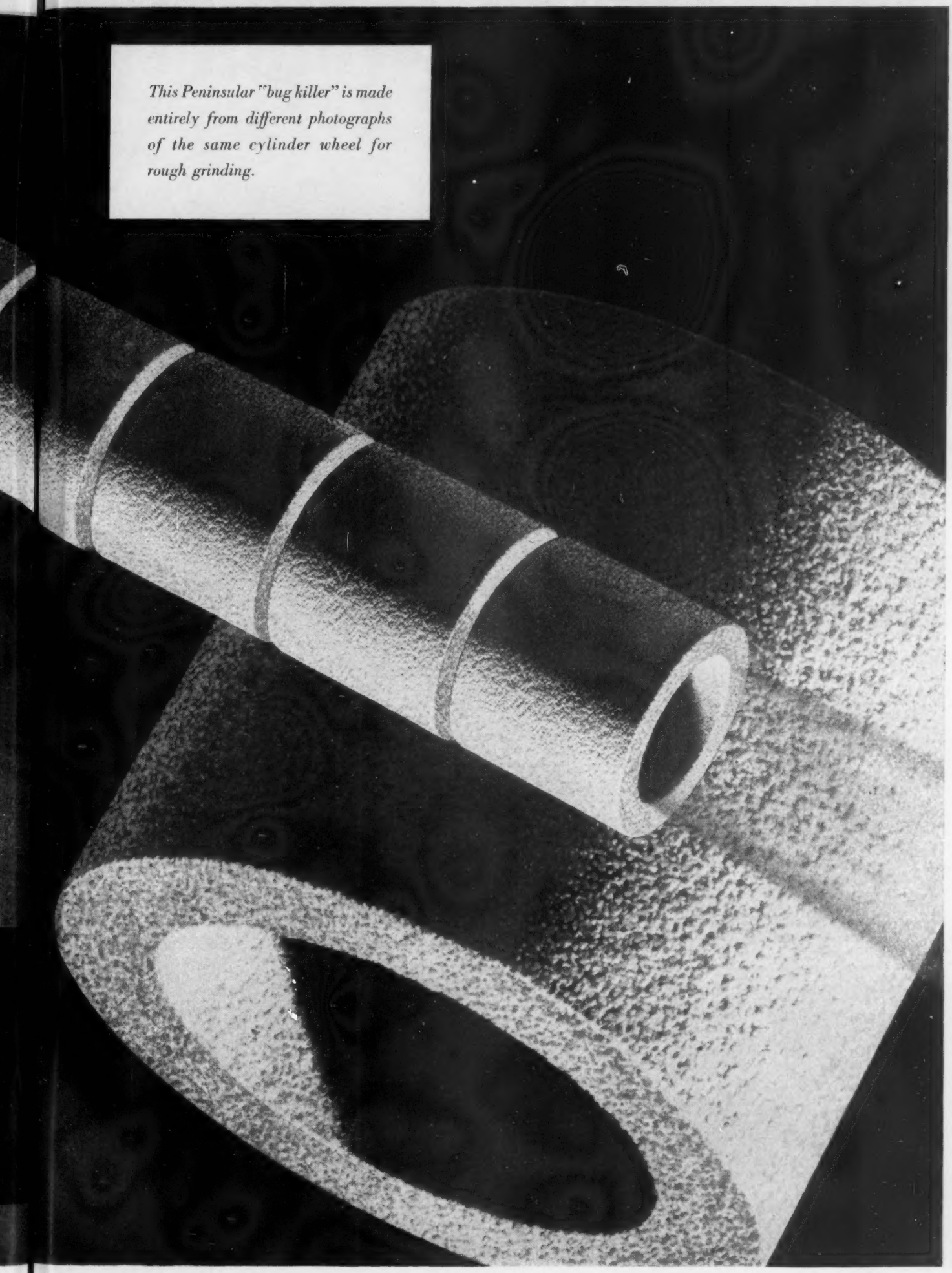
PENINSULAR

INDIVIDUALLY PENINSULAR *ENGINEERED*

GRINDING WHEELS

SINCE 1889

SPECIALISTS IN RESINOID & VITRIFIED BONDED WHEELS

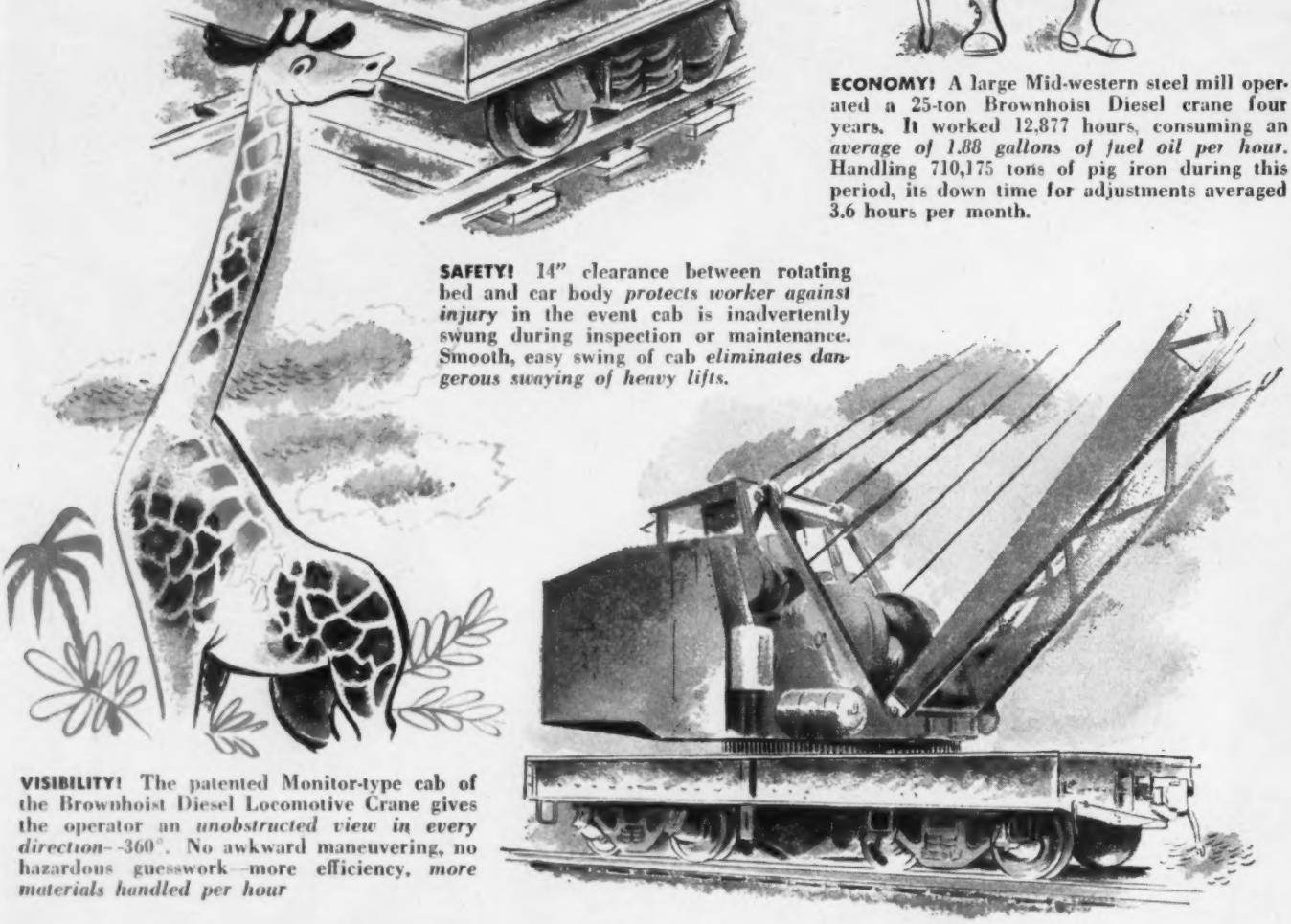


This Peninsular "bug killer" is made entirely from different photographs of the same cylinder wheel for rough grinding.

3 OF THE MANY REASONS WHY BROWNHOIST LOCOMOTIVE CRANES PAY OFF

ECONOMY! A large Mid-western steel mill operated a 25-ton Brownhoist Diesel crane four years. It worked 12,877 hours, consuming an *average of 1.88 gallons of fuel oil per hour.* Handling 710,175 tons of pig iron during this period, its down time for adjustments averaged 3.6 hours per month.

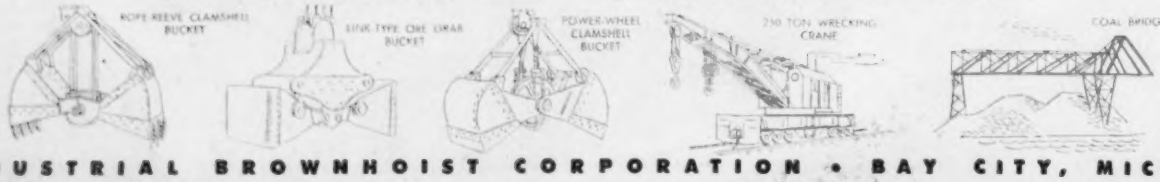
SAFETY! 14" clearance between rotating bed and car body *protects worker against injury* in the event cab is inadvertently swung during inspection or maintenance. Smooth, easy swing of cab *eliminates dangerous swaying of heavy lifts.*



VISIBILITY! The patented Monitor-type cab of the Brownhoist Diesel Locomotive Crane gives the operator an *unobstructed view in every direction*—360°. No awkward maneuvering, no hazardous guesswork—more efficiency, *more materials handled per hour*

From every standpoint—*economy, safety, visibility*—your best long-term investment in materials handling is a Brownhoist Diesel Locomotive Crane. Write today for *new, illustrated literature* giving complete specifications.

BROWNHOIST BUILDS BETTER CRANES



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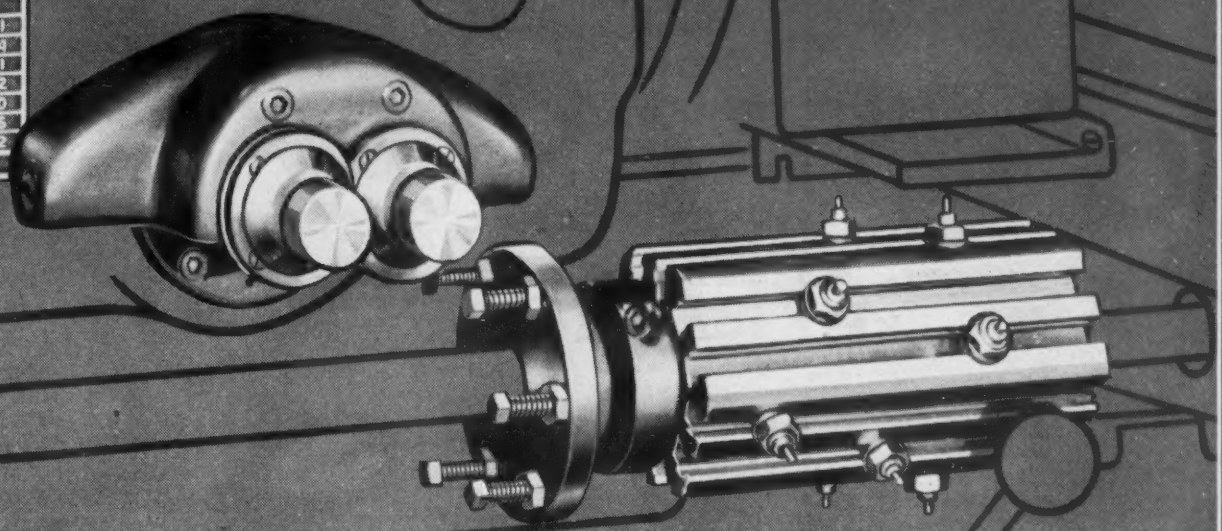
DISTRICT OFFICES NEW YORK, PHILADELPHIA, CLEVELAND, CHICAGO • AGENCIES: DETROIT, BIRMINGHAM, HOUSTON, DENVER, LOS ANGELES, SAN FRANCISCO, SEATTLE, VANCOUVER, B. C., WINNIPEG, CANADIAN BROWNHOIST LTD., MONTREAL, QUEBEC.

GISHOLT FASTERMATICS

(AUTOMATIC TURRET LATHES)

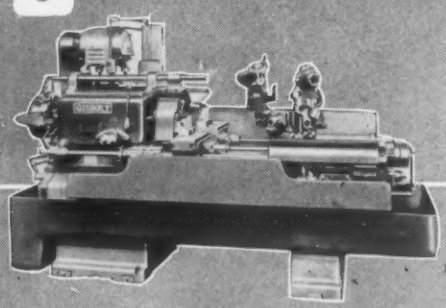
CHANGE GEARS NO. TEETH UPPER	LOWER	SPINDLE SPEEDS VALVE COIL POSITIONS NO. 183	NO. 184	NO. 285
29	89	22	40	74
39	61	27	50	91
33	57	33	61	111
37	53	40	73	134
41	49	48	87	161
43	45	57	105	192
47	41	68	125	230
51	37	81	150	276
57	33	98	181	332

DRIVE SHAFT SPEED 1040 R.P.M.



These simple controls provide automatic (or manual) selection of speeds--to save time --cut machining costs

GISHOLT MACHINE COMPANY, *Madison 3, Wisconsin*



THE GISHOLT ROUND TABLE

represents the collective experience of specialists in the machining, surface-finishing, and balancing of round and partly round parts. Your problems are welcomed here.

THE FASTERMATICS—Speed changes are effected as buttons in spool contact hydraulic control knobs. Changes may be made automatically at any point during hexagon turret's travel, or manually for convenience of set-up. Various ranges of spindle speeds are available.

turret lathes · automatic lathes · superfinishers · balancers · special machines

graphitar guide bushings

(CARBON-GRAPHITE)

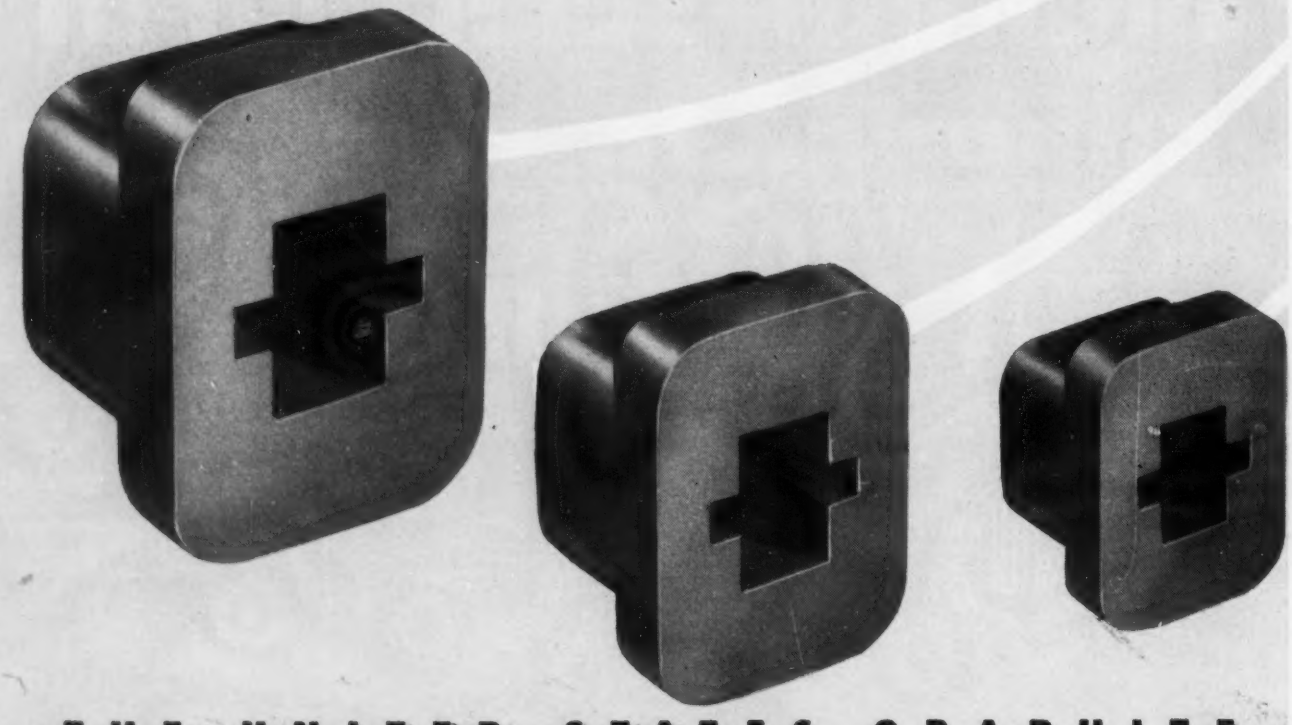
toaster pop up toast "just you like it!"

PROCTOR ELECTRIC COMPANY USES GRAPHITAR GUIDE BUSHINGS TO ASSURE SMOOTH SLIDING OF BREAD PLATFORM PAST TOASTER HEATING COILS

The Proctor Automatic Toaster turns out *delicious slices of uniform toast*, partly because the platform that holds the slice of bread slides smoothly on 4 Graphitar guide bushings. Installed as illustrated, these Graphitar bushings *run freely in the slots*, keeping the platform at an even level—as it raises and lowers.

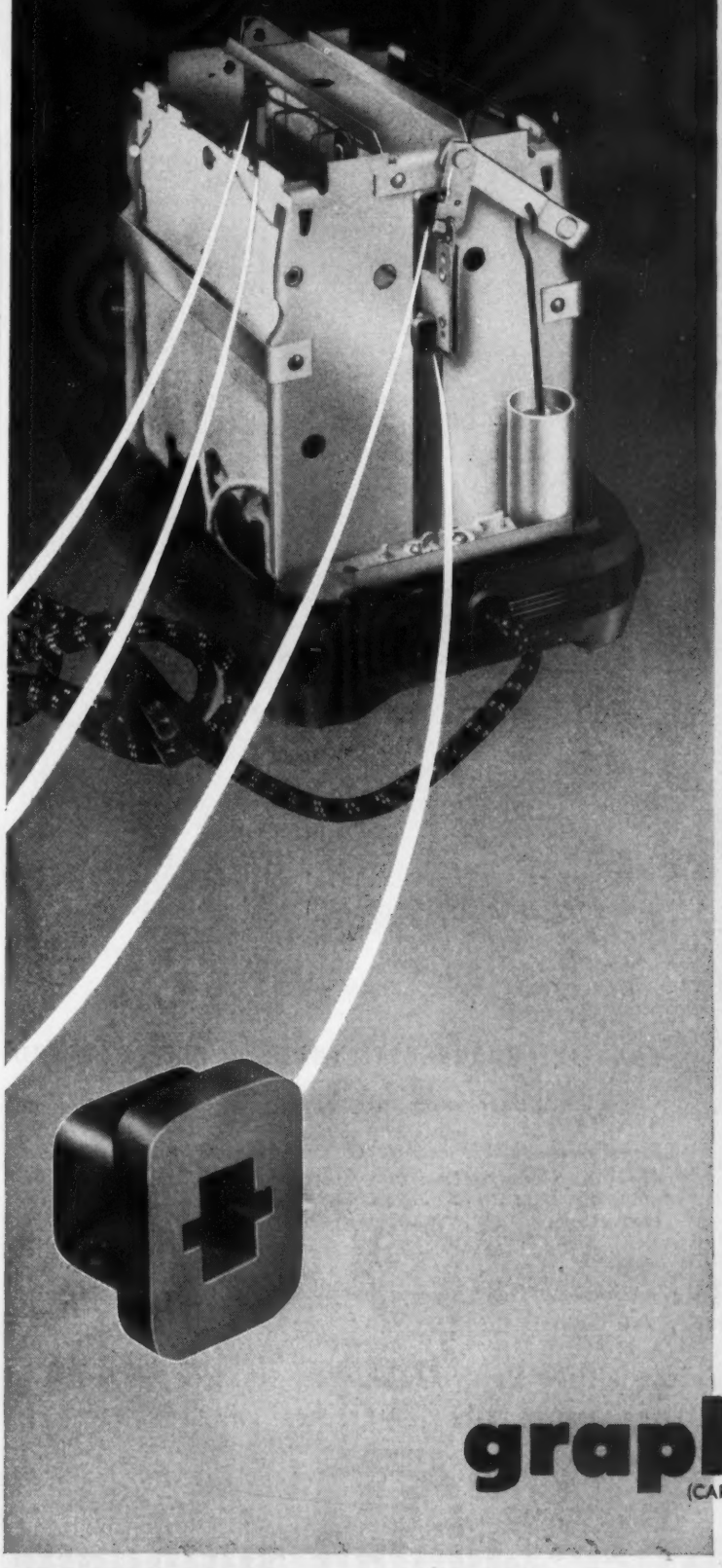
No lubrication of these bushings is ever necessary, because Graphitar is self-lubricating. They operate noiselessly, they withstand the heat for prolonged periods with no distortion or other ill effects, and they contribute a large measure of dependability to help make the Proctor Automatic Toaster one of the most popular appliances in modern homes.

Send us sketches of your products. Our engineers may be able to save you money by showing you where Graphitar parts will improve mechanical performance at less cost. *Write today for 44-page illustrated catalog.*



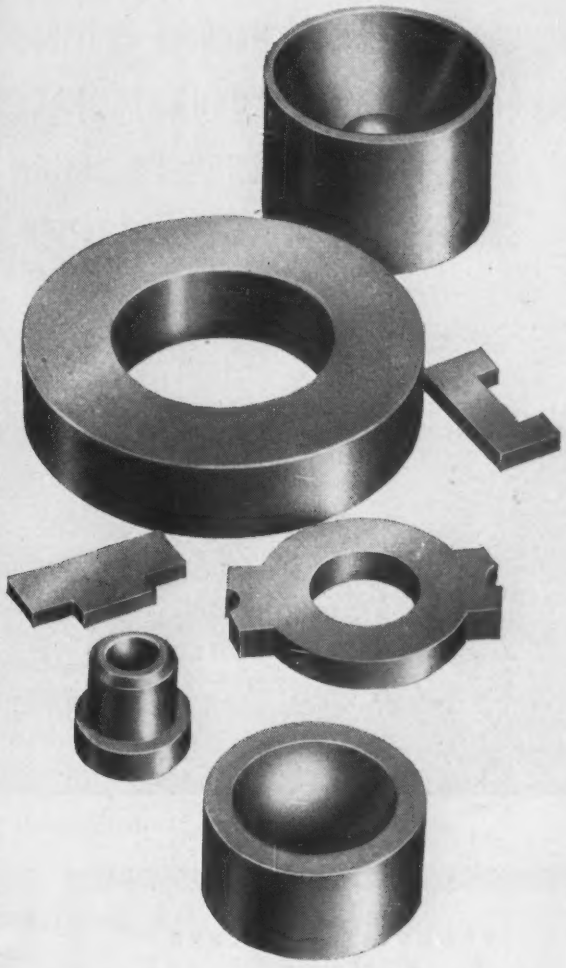
THE UNITED STATES GRAPHITE

help automatic the way



GRAPHITAR HAS VALUABLE PROPERTIES FOR YOU

Graphitar has an almost endless number of applications because of its great versatility. It is a carbon-graphite material that we *can mold to any practical shape* and finish to tolerances as close as .0005" in small sizes. Graphitar bushings, seals, bearings, and other parts are self-lubricating. They are chemically inert. They are practically unaffected by temperature extremes. They are mechanically strong. They are lightweight—*lighter than magnesium parts of the same size and form.*

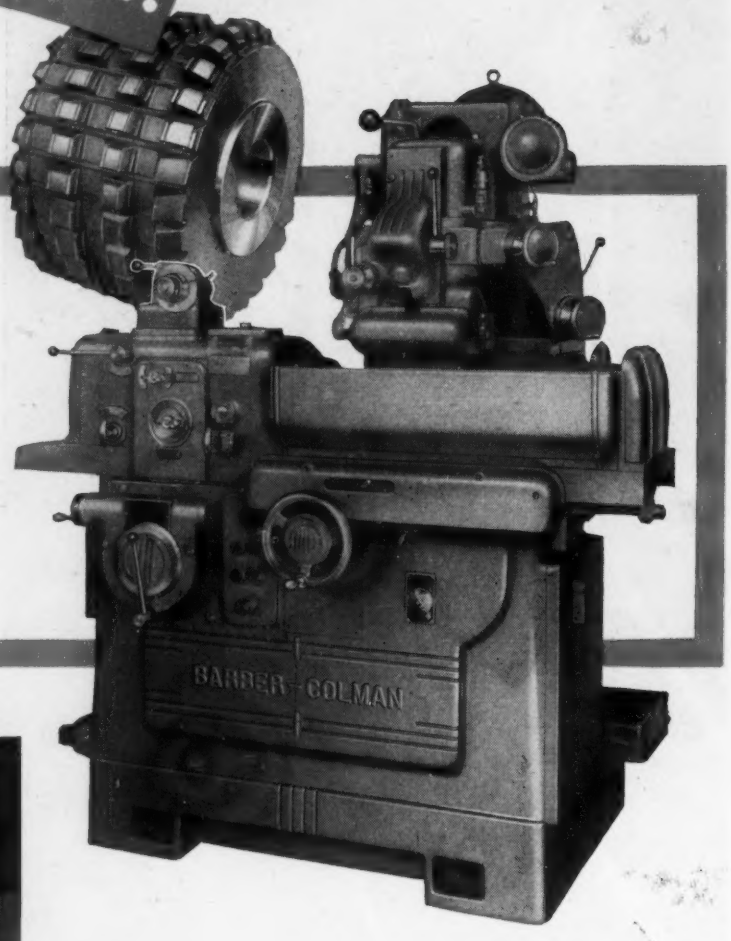


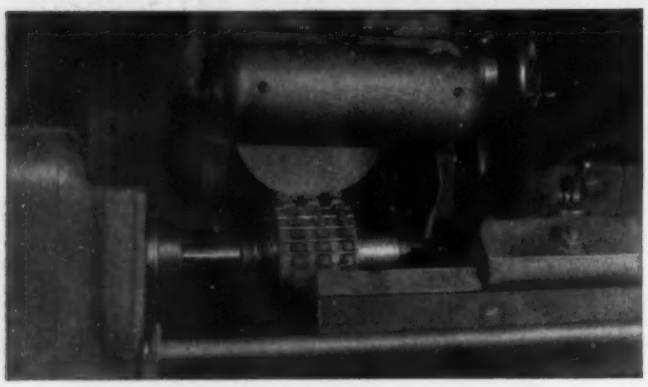
graphitar
(CARBON-GRAPHITE)

COMPANY • SAGINAW, MICHIGAN

COST CUTTING *Begins Here...*

NEW BARBER-COLMAN NO. 6-5 HOB SHARPENING MACHINE PROVIDES EASIER, MORE ACCURATE FACE SHARPENING THROUGH PRECISION CONTROLS AND HYDRAULIC OPERATION.





EXACTING SHARPENING PROBLEM EASILY SOLVED

Class AA Sharpening Maintained To Meet Production Standards.

Stock Removal Varies Due To Taper Root Hob Design.

Machine Construction and Controls Eliminate Usual Inaccuracies Due to Unequal Grinding Wheel Pressure and Deflection.

PRODUCTION RECORD

Operation—Face Sharpen Taper Root Spline Hobs to Class AA Limits

Hobs—5″ Dia. x 3½″ Face, 26 Gashes

Cutting Faces—Radial

Wheel—7″ Carborundum, 3600 RPM

Feed Per Rev.—.0005″

Coolant—Micro-Grind

Accuracy—Adjacent Spacing—.0005″
Non-Adjacent Spacing—.001″
Radial Faces—.0003″

WRITE for complete story on performance and design of this *new* machine. Ask for Bulletin F3213.

EASIER, MORE ACCURATE BARBER B-C COLMAN **HOB SHARPENING**

Barber-Colman Company

GENERAL OFFICES AND PLANT 121 LOOMIS ST. ROCKFORD, ILLINOIS U.S.A.

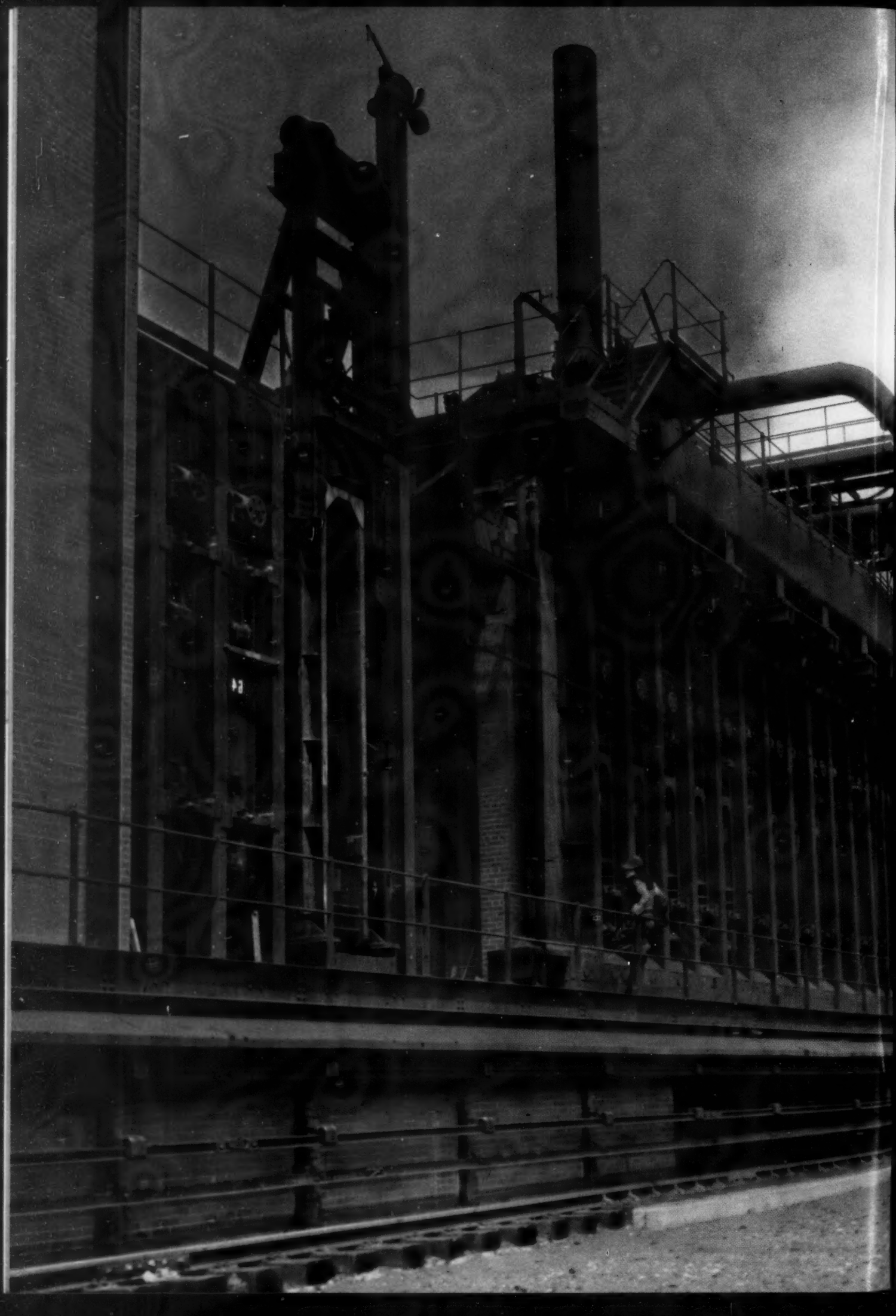
Helical cuts, chamfers, recesses, tapers . . . just give us your specifications, and we'll give you a carbon copy — in bronze! ¶ An up-to-the-minute research laboratory and six modern manufacturing plants assure purest alloys and rapid, inspection-controlled production, in long or short runs. ¶ Our experience, as bearing and bearing metals specialists since 1899, is available to you for engineering consultation. Address:

FEDERAL-MOGUL CORPORATION, 11051 Shoemaker, Detroit 13, Michigan

Power goes to work smoothly through

FEDERAL-MOGUL

Silent FEDERAL Mogul **SLEEVE BEARINGS**



What does it take to build a good coke oven plant?

IT TAKES A GOOD BASIC DESIGN. We believe the Koppers-Becker Coke Ovens have the best of all designs . . . sturdy, free from complications, simple to control, with the largest practical coking capacity. This design can be used over a wide variety of conditions, making metallurgical or domestic coke with heating by any kind of fuel gas normally available, and in large or small sized ovens. The ovens are accessible throughout; this means low maintenance and long life.

IT TAKES CONSTANT ENGINEERING REFINEMENT. The number of coke oven plants which Koppers builds gives this company an unparalleled opportunity to develop new ideas to meet the new needs.

For example, the waste gas recirculation system was developed by Koppers to meet the need for greater coal carbonization capacity per oven. To produce more coke from ovens, it became necessary to make them greater in height. To get uniform heat in walls of very high ovens, when heating with coke oven gas, it was necessary to delay the rate of combustion. This has been accomplished with the waste gas recirculation system.

IT TAKES A FINE ENGINEERING STAFF. The Koppers engineering staff has proved its ability to design and erect the most advanced and efficient coal carbonization, material handling and gas treatment equipment.

KOPPERS COMPANY, INC. KOPPERS BUILDING, PITTSBURGH, PA.

K
KOPPERS

Specify MO-MAX HIGH SPEED STEELS *for all of your* CUTTING *and* TURNING TOOLS

Because only MO-MAX

GIVES YOU *ALL* THESE ADVANTAGES...

1. MO-MAX has superior cutting qualities.
2. The machinability of MO-MAX is unexcelled.
3. MO-MAX is economical. Its specific gravity is about 8% less than that of 18% tungsten steel.
4. MO-MAX is available in a standardized composition; also in cobalt and high vanadium varieties for special high speed steel requirements.
5. For 14 years MO-MAX has demonstrated its superiority in all types of cutting tools.

Learn all the facts! **Send for your copy of the MO-MAX Handbook, sixth edition. Get the full story about this remarkable steel, including easy-to-follow instructions on heat treating.**

THE CLEVELAND TWIST DRILL COMPANY

1258 East 49th Street • Cleveland 14, Ohio

Buyer's Guide to Brands of MO-MAX

"LMW"	Allegheny Ludlum Steel Corporation
"MOHICAN"	Atlas Steels Limited
"BETHLEHEM HM"	Bethlehem Steel Company
"MO-CUT"	Braeburn Alloy Steel Corporation
"STAR MAX"	Carpenter Steel Company
"MOLITE M-1"	Columbia Tool Steel Company
"REX T-MO"	Crucible Steel Company of America
"DI-MOL"	Henry Disston & Sons, Inc.
"HI-MO"	Firth-Sterling Steel Company
"REX T-MO"	Halcomb Steel Company
"MOGUL"	Jessop Steel Company
"TATMO"	Latrobe Electric Steel Company
"MIDMAX"	The Midvale Company
"S. T. M."	Simonds Saw & Steel Company
"MO-TUNG"	Universal-Cyclops Steel Corporation
"S-N-2"	Vanadium-Alloys Steel Company
"VUL-MO"	Vulcan Crucible Steel Company

"Which Squirrel-Cage Motor Shall I Buy?"

Open-Type? This general-purpose squirrel-cage motor meets about 9 out of every 10 application requirements; so chances are it's the design you'll select. Allis-Chalmers builds generously proportioned, rugged *open-type* squirrel-cage motors in sizes from 1 hp to the largest practical requirement.

Splash-Proof? Where operating conditions are conducive to entrance of particles or liquids into ordinary motors from either top or sides, Allis-Chalmers *splash-proof* squirrel-cage motors may be your best buy. They're designed to *exclude* top or side directed particles and liquids. Sizes 1 hp to the largest.

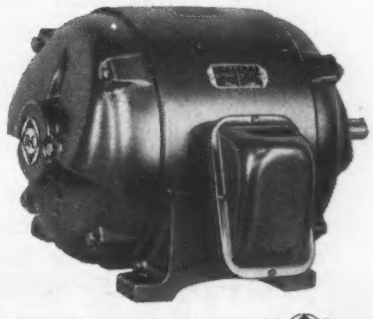
Vertical? or Flange-Type? *Either* can solve a space problem. *Vertical* motors (sizes 1 hp to largest) for vertical drives. *Flange-mounted* for side or angle drives. In both types bearings and closures are designed to prevent grease escapement. Mounting flange for attaching to your base can be provided.

Totally-Enclosed? Explosion-Proof? Completely weather-proof and fan-cooled, these motors are built to beat abrasive dust, dirt and corrosive fumes, or moisture conditions that cause windings in ordinary motors to deteriorate. *Explosion-proof type* for oil refineries, paint, varnish or lacquer plants, etc.; Underwriters approved; reduce hazards in explosive or dust atmospheres. Either type built from 1 hp and up.

Are Motor Decisions More Important Today?

YOU BET THEY ARE! One *obvious* reason is the need for keeping costs down. Another is that in the rush to fill demand much equipment is being misapplied; making it harder to maintain profits not alone today, but tomorrow, the next day and the next year—as long as misapplication continues!

That's why it's important to take a good look at motors — their characteristics — your equipment — power source and surroundings — *before* you buy and apply! If you're in doubt, don't take chances — call a motor expert! ALLIS-CHALMERS, MILWAUKEE 1, WIS. A 2327



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A CENTURY OF SERVICE to Industry THAT MADE America Great

ALLIS-CHALMERS

One of the Big 3 in Electric Power Equipment-
Biggest of All in Range of Industrial Products

REPEATED SHOCK-LOADING PROVES DEPENDABILITY

***MULTIROL*®**
CAM-FOLLOWER BEARINGS
IN HYSTER PRODUCTS
MUST 'STAND THE GAFF'

McGill Selected for

• LONG LIFE • SMOOTH ACTION • DEPENDABILITY

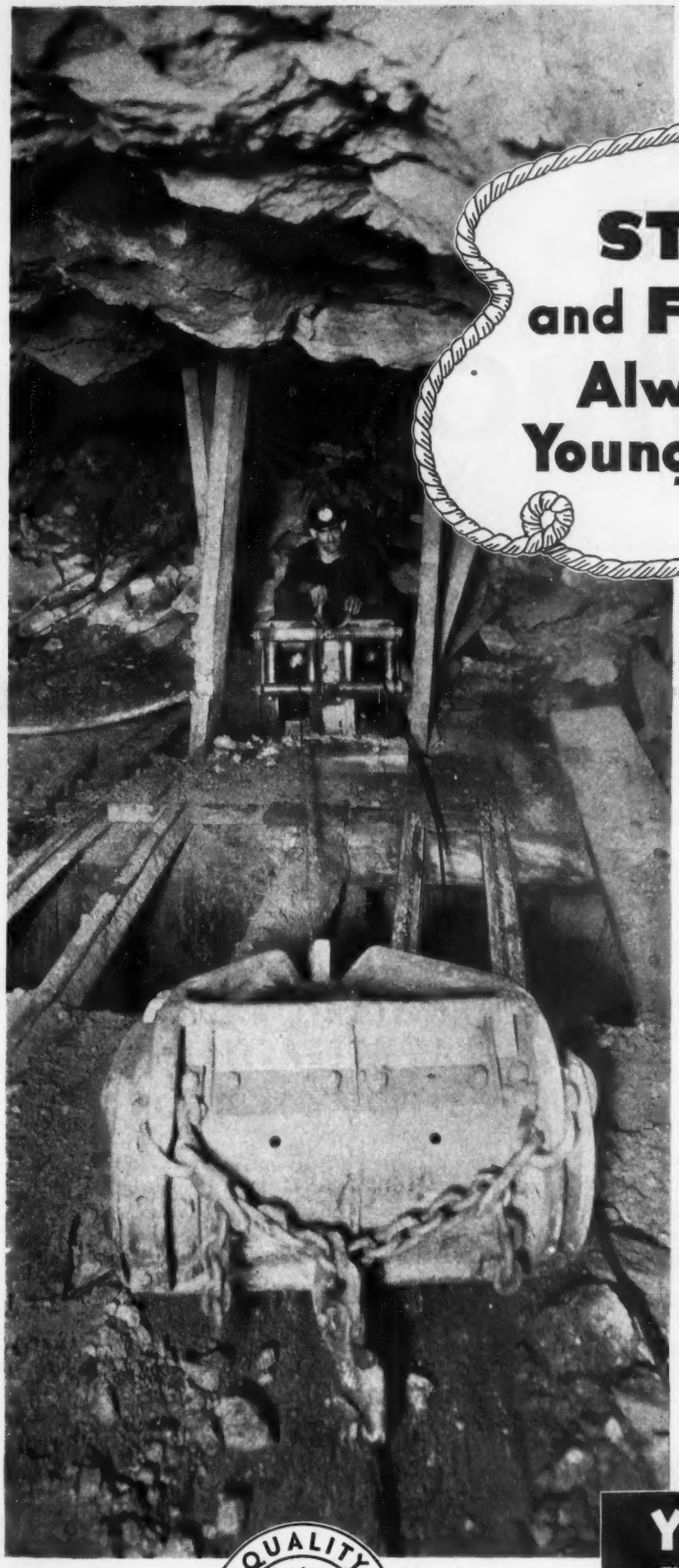
Eight McGILL *MULTIROL* CAM FOLLOWER BEARINGS are used in the Number 40 Hyster Lift Truck made by the Hyster Company, Portland, Oregon. Four of these are located in the load-on apron assembly and four in the hoisting mechanism.

The four thousand pound loads that these trucks carry ride smoothly on free-rolling *MULTIROL* CAM FOLLOWER BEARINGS. Extra heavy race sections, specially heat treated, give an extra margin of load carrying capacity that withstands repeated and severe shock loading conditions. In many applications the Hyster trucks are driven three shifts, 24 hours daily, and as the manufacturer states, the most important feature is the long-life.

McGill Bearings are also used in other Hyster Lift Trucks such as the Number 20 and in other Hyster products including the D7N Towing Winch and A-frame Arch . . . all of which must carry heavy loads and operate smoothly and dependably.

For complete MULTIROL CAM-FOLLOWER information write today for Bulletin CF-40A:
McGill Manufacturing Company, Inc.,
401 N. Lafayette Street, Valparaiso, Indiana.

McGILL
precision bearings



STRENGTH and FLEXIBILITY Always "*Firsts*" in Youngstown RopeWire

Miles Under Ground

IN few industrial services can a cable break be more costly than in the remote reaches of underground mining--costly to repair or replace, costly to production, costly sometimes to human life.

Above all-below ground--wire rope must be strong and flexible, tough and corrosion resistant. These essential properties depend on the quality of the wire from which the rope is woven.

Specify Yolectro High Carbon Rope Wire and you can depend on it that your wire rope will have these wanted qualities and will keep them through a long lifetime of dependable service. Like all Youngstown wire mill products, Yolectro High Carbon Rope Wire is produced from the finest quality steel, refined, rolled and drawn to exacting specifications.

Photo by courtesy of the Preformed Wire Rope Information Bureau.

QUALITY TRADE MARK YOUNGSTOWN SERVICE

YOUNGSTOWN

THE YOUNGSTOWN SHEET AND TUBE COMPANY

GENERAL OFFICES - YOUNGSTOWN 1, OHIO

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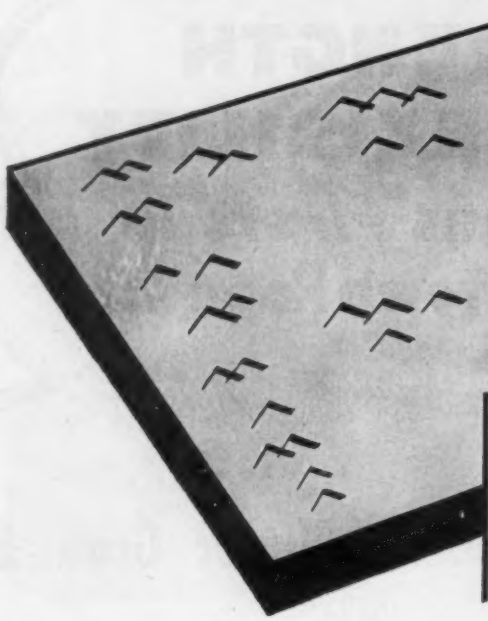
Manufacturers of

CARBON - ALLOY AND YOLOY STEELS

Bars - Rods - Wire - Cold Drawn Carbon Steel Rounds - Electrolytic Tin Plate - Coke Tin Plate - Pipe and Tubular Products - Sheets - Plates - Conduit - Tie Plates and Spikes

UNION PACIFIC

TREASURE MAP OF INDUSTRY



Wyoming

- VAST SUPPLY OF COAL, IRON AND PETROLEUM
- LEADING LIVESTOCK STATE
- TREMENDOUS WOOL CLIP
- IMPORTANT MARKETING CENTER OF POULTRY AND DAIRY PRODUCTS
- LARGE PRODUCER OF SUGAR BEETS, POTATOES AND GRAINS
- EXCELLENT TRANSPORTATION
- OUTSTANDING SCENIC AND RECREATIONAL ATTRACTIONS
- HEALTHFUL LIVING CONDITIONS

One of a series of advertisements based on industrial opportunities in the states served by the Union Pacific Railroad.

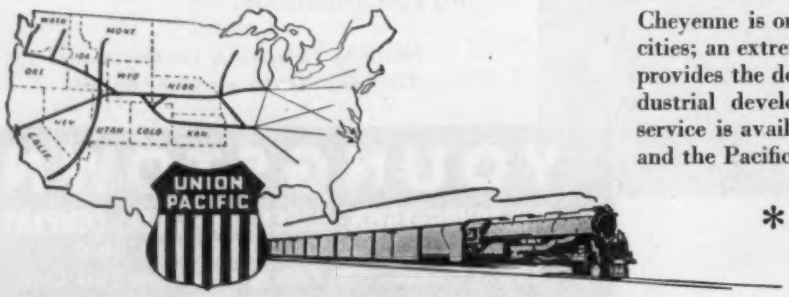
In Wyoming manufacturers will find a vast amount of raw materials. It is a leading state in potential mineral resources; produces great quantities of iron . . . has the world's largest untapped supply of coal. Copper, silver, gold, lignite and bentonite are among the mined metals and minerals. The State contains 27 oil fields and large timber lands.

Wyoming is one of the greatest of livestock States, producing fine beef cattle. Its wool clip is tremendous. Poultry raising and dairying are important activities. Principal crops are sugar beets, potatoes and grains.

The healthful climate . . . scenic and recreational attractions such as Yellowstone-Grand Teton National Park and scores of dude ranches . . . a fine educational system . . . are incentives to living in this western region.

★ ★ ★ ★

Cheyenne is one of the principal Union Pacific mainline cities; an extremely important point to the railroad which provides the dependable transportation so essential to industrial development. For travelers, daily Streamliner service is available from Cheyenne to and from Chicago and the Pacific Coast.



** Address Industrial Department, Union Pacific Railroad, Omaha 2, Nebraska, for information regarding industrial sites.*

UNION PACIFIC RAILROAD

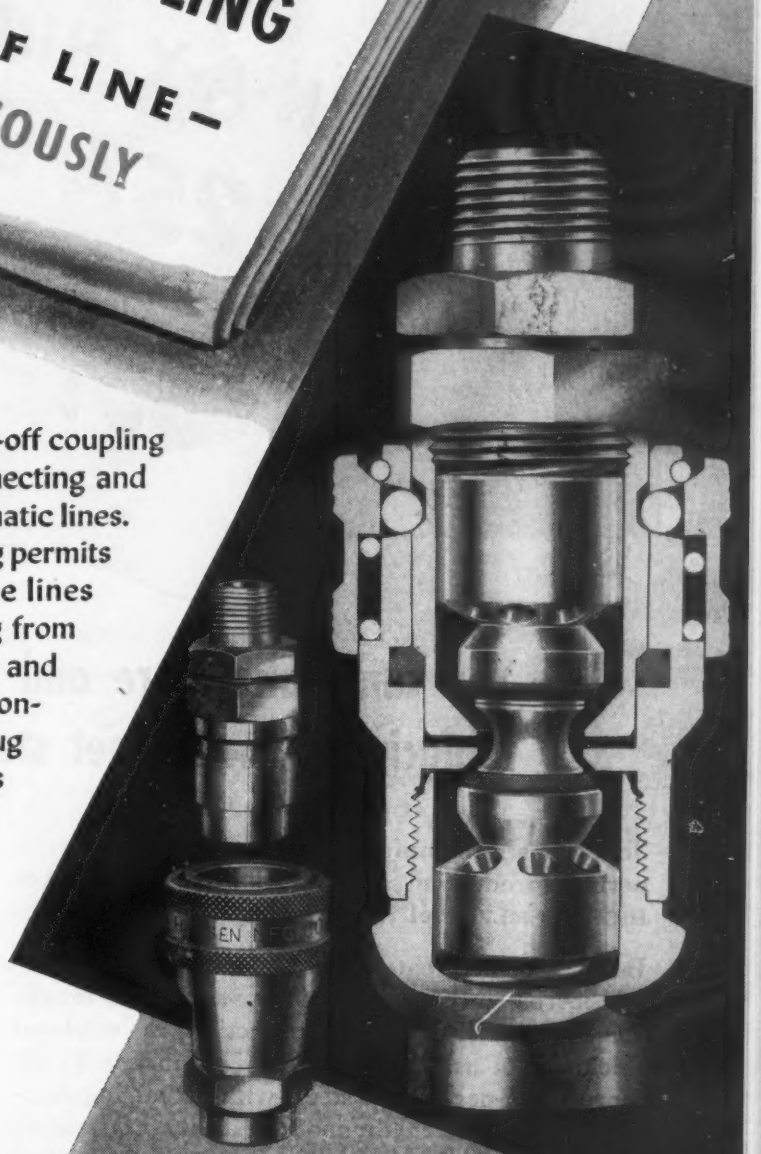
THE STRATEGIC MIDDLE ROUTE

NEW! FOOLPROOF!

HANSEN

TWO-WAY SHUT-OFF COUPLING

SEALS BOTH ENDS OF LINE—
AUTOMATICALLY...INSTANTANEOUSLY



The new Hansen two-way shut-off coupling provides for easy—quick—safe connecting and disconnecting of hydraulic and pneumatic lines. This unique "spool type" valve coupling permits the instant sealing of each end of the lines immediately upon disconnection of plug from socket. To connect, you pull back sleeve and merely push plug into socket—coupling is connected and locked—valves in socket and plug are open, automatically permitting oil or gas to flow freely in either direction. To disconnect, push back sleeve — this disconnects coupling. Socket and plug are each positively sealed, automatically preventing loss or spillage of fluid. Check the many advantages in time, labor and cost savings provided in this new Hansen two-way shut-off coupling.

Full details in new Hansen Bulletin. Write for your copy.

REPRESENTATIVES

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Eastern, Southern States:
B-R ENGRG. CO., Baltimore, Md.

Northern Ohio:
F. & W. URSEM CO., Cleveland, O.

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STEINHAGEN AIRLINE PRODUCTS, Dayton, O.

Northern Ill., Eastern Iowa:
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WM. H. NASH CO., Detroit, Mich.

THE HANSEN MANUFACTURING CO.

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THE NEW ARITHMETIC IN STEEL
STEEL ENGINEERING AND APPLICATION DATA
200
N-A-X HIGH TENSILE
=25% LESS STEEL PER UNIT
=33⅓% MORE UNITS PER TON

COPYRIGHT 1946, GREAT LAKES STEEL CORPORATION

You can make more and better products per ton by replacing carbon sheet steel with N-A-X High-Tensile

Today, many manufacturers are enjoying the important production advantages brought by N-A-X HIGH-TENSILE steel.

Because of its greater strength, toughness, fatigue- and corrosion-resistance, this low-alloy, high-tensile steel ordinarily permits reduction in sectional thickness of as much as 25%. This means 33⅓% more units per ton of steel—with actual improvement in the strength and durability of finished products. And because N-A-X HIGH-TENSILE steel has exceptional ductility for high-strength steel, it can be deep-drawn and formed into intricate shapes.

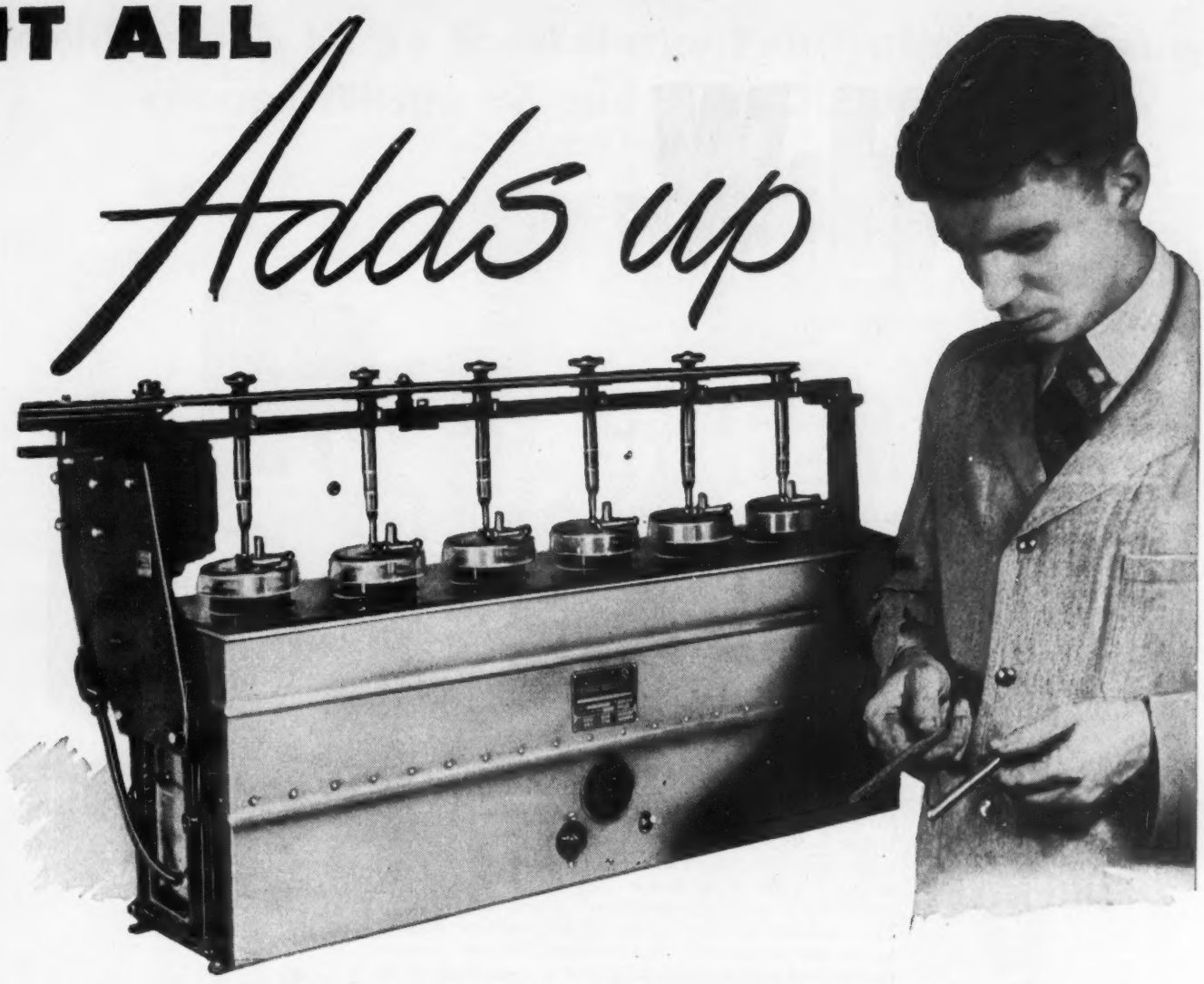
In addition to the savings in steel provided by N-A-X HIGH-TENSILE, economies in handling, fabricating and finishing operations can often be effected.

Tomorrow, N-A-X HIGH-TENSILE will be available in ever greater quantities and to a wider field of users. Even though current production can't always keep pace with demand, our engineers will be glad to show you how helpfully N-A-X HIGH-TENSILE steel can fit into your future production picture.

MAKE A TON OF SHEET STEEL GO FARTHER
Specify—
N·A·X
HIGH-TENSILE STEEL

GREAT LAKES STEEL CORPORATION
N-A-X ALLOY DIVISION • DETROIT 18, MICHIGAN
UNIT OF NATIONAL STEEL CORPORATION

IT ALL *Adds up*



Where special qualities are essential for safe, enduring industrial lubrication, Sinclair Research develops additives that will "further improve the best".

Pictured above is one apparatus used by Sinclair Research to determine the rust-inhibiting efficiency of oils manufactured for turbine use. Chemical additives are studied to provide such protection against rust. Obviously, the treated oil sample used on the metal rod in the technician's left hand has high rust-inhibiting efficiency and prevented the deposit shown on the other rod.

All Sinclair Research and Refinery Control is similarly thorough. *It all adds up* . . . to assure you of lubricant qualities essential to efficient and economical industrial maintenance in all applications.

Sinclair Metal Working Oils

For General Alloy Steels:
WILKUT OILS

For Tough Alloys:
AUTOKUT OILS

For Water Emulsions:
SATISOL and TOOLTEX

For Honing:
HONOL OILS

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Lubricants for Industry

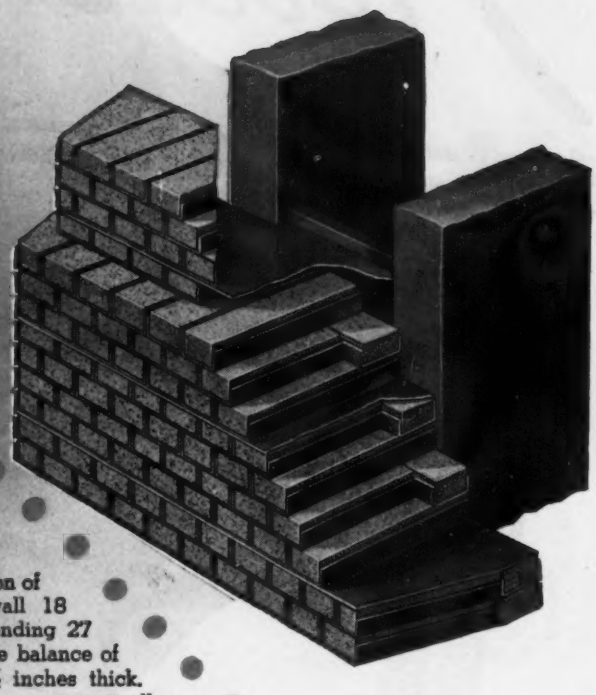
FINEST CRUDES + EXPERT RESEARCH and MANUFACTURING CONTROL = OUTSTANDING PERFORMANCE

H-W

IMPROVED METALKASE

PATENTED AND PRODUCED EXCLUSIVELY BY HARBISON-WALKER

FRONT WALLS



FOR BASIC OPEN-HEARTH STEEL FURNACES

The illustration shows a typical section of H-W Improved Metalkase front wall 18 inches thick beginning at and extending 27 inches above the door sill level. The balance of the wall to the skew line is 13½ inches thick.

Steel plates are used at every fourth course vertically. Tack-welded to these are 1½ by 1½ inch steel bars which, in turn, are welded to the solid buckstays. This new improved construction adds rigidity and assists in keeping the plates in place. The use of 9 inch, 13½ inch and 18 inch straights and two special tapered jamb shapes insures a tightly bonded front wall.

Special Tapered Jamb Brick provide additional clearance for the charging machine.

FOR LONGER CONTINUOUS OPERATION AND GREATER TOTAL PRODUCTION

In open-hearth front walls, H-W Improved Metalkase are giving from 5 to 10 times the life of silica and as much as twice the service of other basic refractories.

In open-hearth back walls, H-W Improved Metalkase are repeatedly demonstrating their superiority over other basic brick — and are giving many times the service of silica brick.

In open-hearth end walls, H-W Improved Metalkase are giving two and even three complete furnace campaigns.

The use of H-W Improved Metalkase Skewbacks and of narrow shoulders of H-W Improved Metalkase at both front and back walls not only increases the life of the roofs but also results in much longer life of front and back walls.

FRONT WALLS
END WALLS
BACK WALLS
SKEWBACKS
ROOF SHOULDERS

TRADE-MARK

REG. U. S. PAT. OFF.

HARBISON-WALKER REFRACTORIES CO.

and Subsidiaries

WORLD'S LARGEST PRODUCER OF REFRACTORIES

GENERAL OFFICES, PITTSBURGH 22, PENNSYLVANIA

Welders of a Large Steel Barge Fabricating Company choose Wilson 98 and 98V&O Electrodes

(A.W.S. CLASS. NO. E6010)

This concern left the selection of A.W.S. Class. No. E6010 electrodes up to the welders. They went for Wilson 98 and 98V&O – 100%.

These two D.C. reverse polarity, shielded arc electrodes are designed primarily for the fabrication of mild steel plate and rolled sections.

They can also be used to weld many low alloy high tensile steels where thin sections are involved. Made with an extruded cellulose type of coating, 98 and 98V&O offer these three notable features:

1. ***A high burn-off rate that gives excellent deposition rate and fast welding speeds.***
2. ***A deposit that solidifies quickly making it easy to use in all positions; particularly vertically down.***
3. ***Produce high quality, flat-faced fillets in all positions.***

Both electrodes are identical except No. 98V&O has a thinner coating which makes it especially easy to handle in vertical and overhead positions.

Fill in and mail the coupon and a copy of the Wilson Electrode Catalog will be sent you. Or, if you prefer, address your nearest Wilson distributor.

WILSON

WILSON WELDER and METALS CO., INC.

General Offices: **60 EAST 42nd STREET, NEW YORK 17, N. Y.**

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S WILSON WELDER & METALS CO., INC.
60 East 42nd Street
New York 17, N. Y.
IX

Please send me a copy of Wilson Electrode Catalog ADW 75 together with the latest electrode price list.

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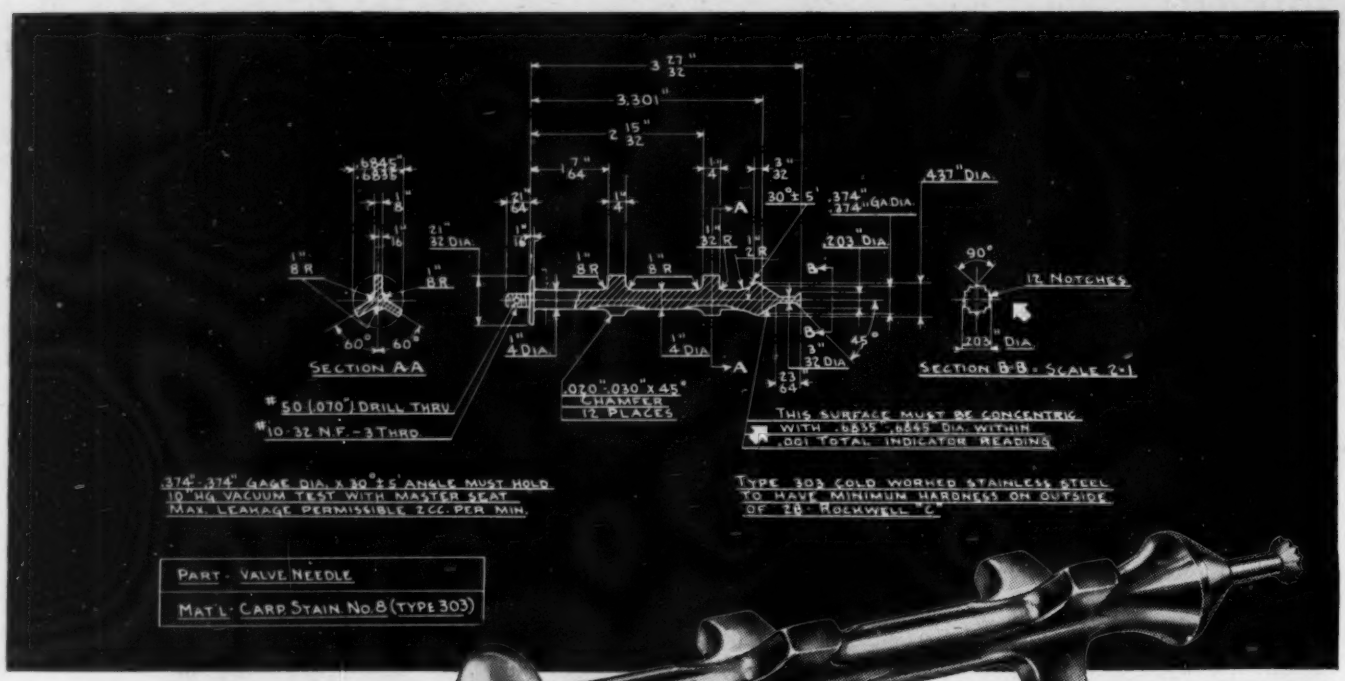
Address_____

City_____ Zone_____ State_____


3 27/32"
3.301"
2 15/32"
.6845"
.6835"
.437" DIA.
.374"
.374" GA DIA.
30° ± 5'
.203" DIA.
12 NOTCHES
SECTION A-A
SECTION B-B - SCALE 2:1
60°
60°
90°
45°
#50 (.070") DRILL THRU
#10-32 N.F.-3 THRD
.070" x .030" x 45° CHAMFER 12 PLACES
THIS SURFACE MUST BE CONCENTRIC WITH .6835" .6845" DIA. WITHIN .001 TOTAL INDICATOR READING
.374" .374" GAGE DIA. x 30° ± 5' ANGLE MUST HOLD 10" HG VACUUM TEST WITH MASTER SEAT. MAX. LEAKAGE PERMISSIBLE 2 CC. PER MIN.
TYPE 303 COLD WORKED STAINLESS STEEL TO HAVE MINIMUM HARDNESS OF 28 ROCKWELL "C"
PART - VALVE NEEDLE
MAT'L - CARP. STAIN. NO. 8 (TYPE 303)

Valve Needle made from Carpenter Stainless No. 8

Now-

USEFUL INFORMATION *to cut costs where you* MACHINE STAINLESS STEEL!

● Correct speeds, better finishes and longer tool life on your machining jobs will lead you to a lower cost on each unit made from Stainless bar stock.

For the lower unit costs that are so important now, ask your nearby Carpenter representative for your copy of the new Carpenter "NOTEBOOK on Machining Stainless Steels". Just published, this 116-page NOTEBOOK is packed full of useful shop hints and machining information . . . much of it never before printed. For example—

COMPLETE CHECK CHARTS in each section list common trouble spots, and help you find the best cure in each case.

SPEEDS AND FEEDS recommended for various types of Stainless are given in the useful table you'll find in each chapter.

LUBRICATION AND STONING are thoroughly covered. The NOTEBOOK is a complete and up-to-date shop tool for any plant where Stainless is machined.

Your Carpenter representative will be glad to give personal copies to Production and Management executives. And if you want extra copies for the men in your plant, they can be secured at cost—50¢ apiece.

THE CARPENTER STEEL CO. • 139 W. BERN STREET • READING, PENNA.

Carpenter

FREE-MACHINING

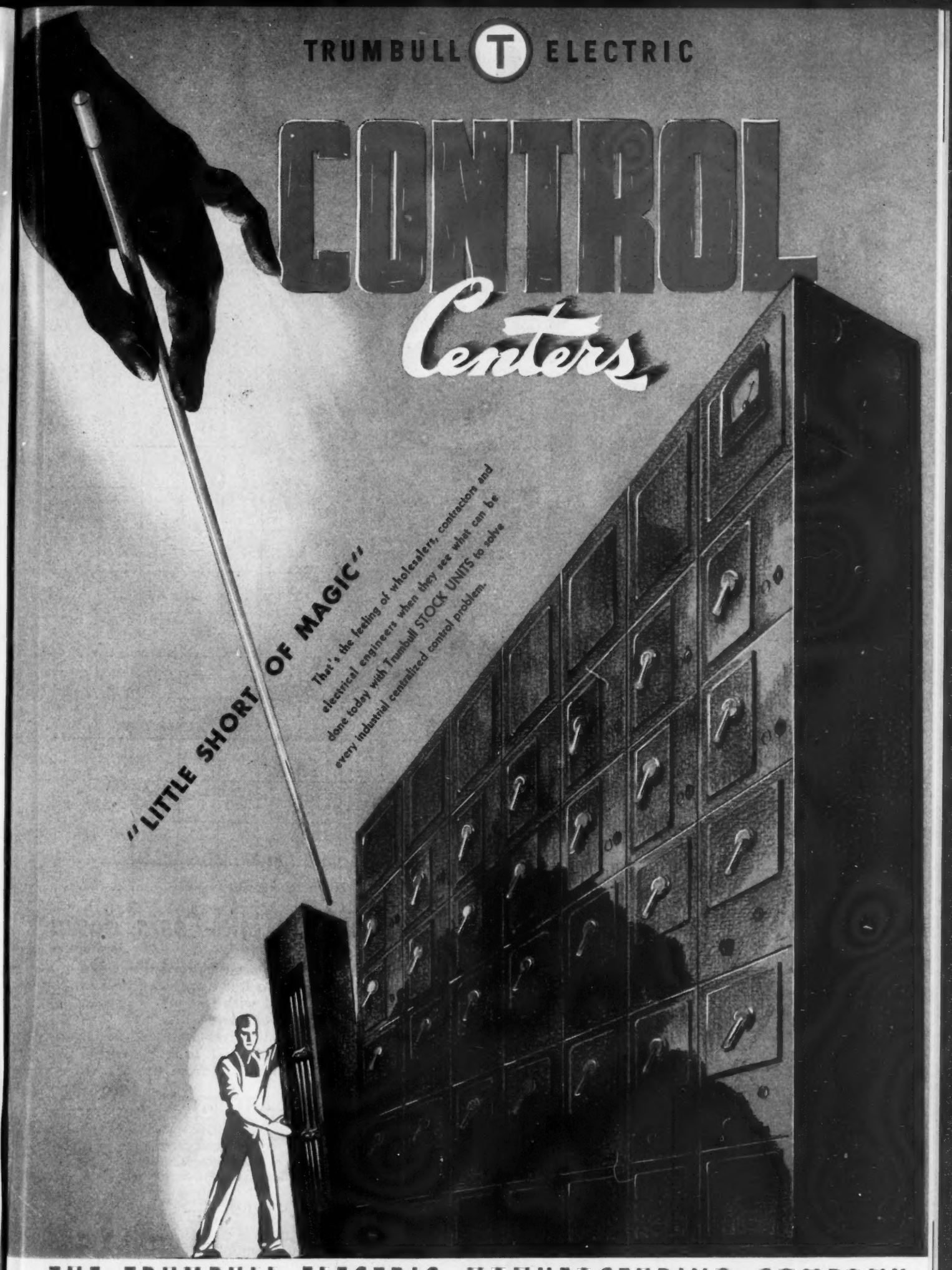
STAINLESS STEELS

AVAILABLE FOR PROMPT SHIPMENT FROM STOCK

more than corrosion resistance

Branches: Bridgeport, Conn. • Boston • Buffalo • Chicago • Cincinnati Cleveland • Dayton • Detroit • Hartford • Indianapolis • Los Angeles • New York Philadelphia • Providence • St. Louis • Worcester, Mass.

SEE THE CLASSIFIED SECTION OF YOUR TELEPHONE DIRECTORY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CONTROL
Centers
"LITTLE SHORT OF MAGIC"
That's the feeling of wholesalers, contractors and electrical engineers when they see what can be done today with Trumbull STOCK UNITS to solve every industrial centralized control problem.

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SIMONDS Red Tang FILES

...they keep your File-Costs down

RED TANG FILES have the same basic tooth-design as Simonds Metal-Cutting Saws. So Red Tangs *cut,* instead of *scrape* . . . remove more metal with less elbow-grease. That's why workers like them. *And here's why YOU will like them:* They last longer . . . and deliver more and better work per file-dollar. Order Simonds Red Tank Files from your Industrial Supply Distributor, or from the nearest Simonds office listed below.

BRANCH OFFICES: 1350 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 W. Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 311 S. W. First Avenue, Portland 4, Ore.; 31 W. Trent Avenue, Spokane 8, Washington; *Canadian Factory:* 595 St. Remi St., Montreal 30, Que.

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"Our PLYMOUTH LOCOMOTIVE is a big time and money saver"

"A big time and money saver" says the Yard Foreman of National Malleable & Steel Castings Company in describing the 35-ton Plymouth Gasoline Locomotive in service at the Cicero, Illinois plant.

Used in hauling raw materials to various production departments, spotting freight cars for loading and unloading, and for transporting rough castings and finished products, this Plymouth at National Malleable provides unlimited, low-cost and dependable haulage involving a minimum of maintenance cost.

Wherever haulage is being done cheaper and faster you'll find a Plymouth doing it. That's the reason why you'll be interested in the Plymouth story in terms of your intraplant haulage problem. For complete information, write—Dept. A-1, Plymouth Locomotive Works, Plymouth, Ohio.

PLYMOUTH LOCOMOTIVES

GASOLINE, DIESEL MECHANICAL AND DIESEL ELECTRIC

PLYMOUTH LOCOMOTIVE WORKS • Division of The Fate-Root-Heath Co., Plymouth, Ohio, U.S.A.

back of the steel castings that "Keep 'em Rolling"

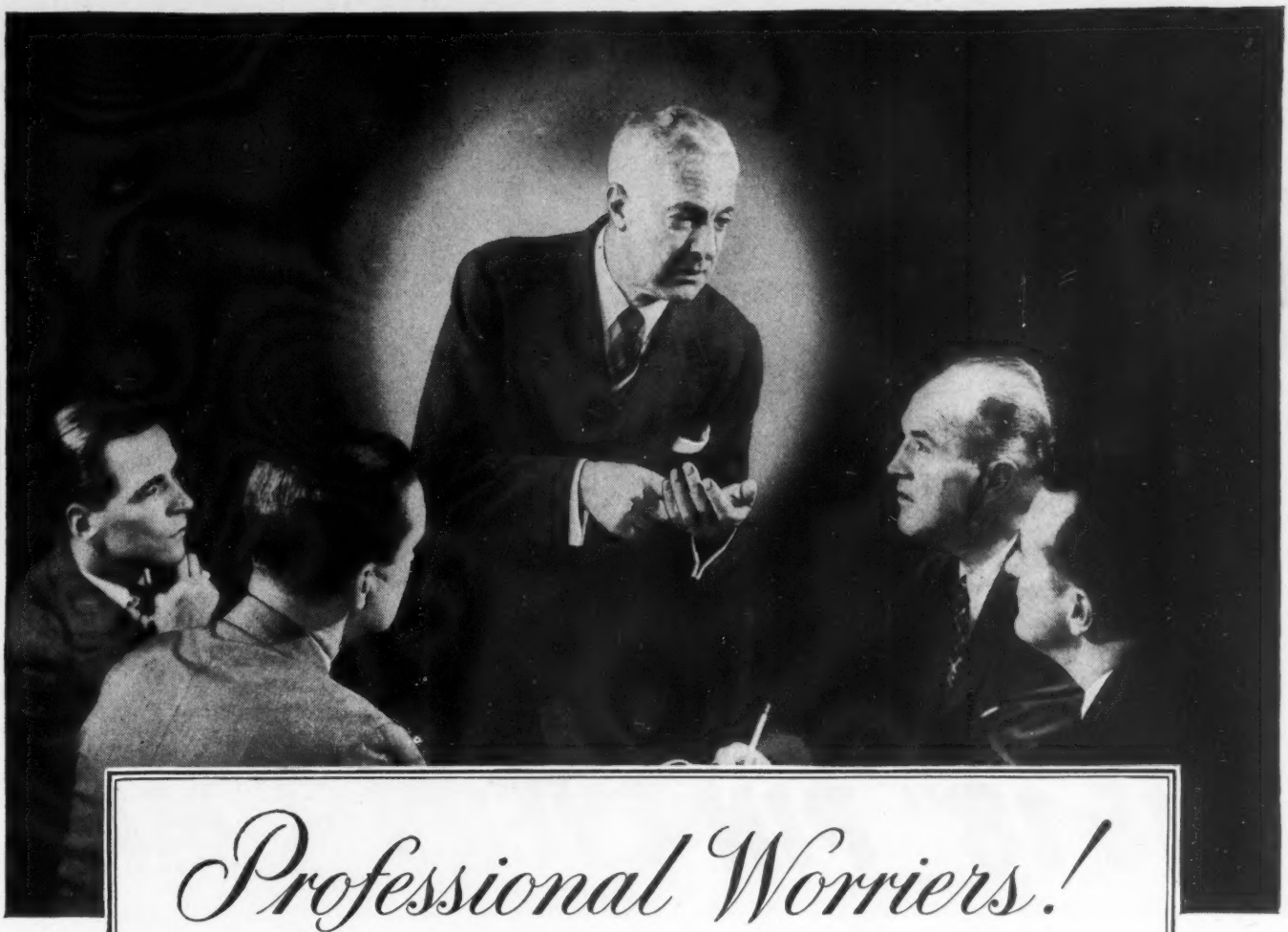
INTERNATIONAL GRAPHITE ELECTRODES

Getting the most service out of transportation equipment calls for tough, wear-resistant alloy steel castings on rolling stock, track crossings, switches, and in yards and shops. Makers of the electric furnace steels for these castings depend on International Graphite Electrodes as an essential factor to electric steel quality. They have proved to their own satisfaction in the severest tests of all – in actual furnace operation under a wide range of requirements – that International Graphite Electrodes offer physical, electrical and chemical properties in the right combination.

Specify International Electrodes for economical performance and all around satisfaction; you'll see why furnace operators everywhere prefer them. Write for complete information today.

Specify INTERNATIONAL Graphite Electrodes for – Slow consumption – High current capacity – Low rate of oxidation–High thermal conductivity–High degree of purity–Consistently uniform properties and dimensions – Low cost per ton of production.

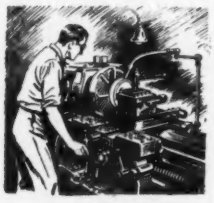
International Graphite & Electrode Corp.
SAINT MARYS, PA.



Professional Worriers!

Every business, time and again, runs into production snags. When the problem is *lubrication*, we're often called in to do the worrying. And eight times out of ten we come up with the right answer—*fast*. Because that's our job day in, day out, year after year—putting petroleum to work *efficiently*. This backlog of experience, coupled with the world's finest lubricants and fuels, is your best reason for calling Cities Service next time trouble calls on you.

CITIES SERVICE STOPPED TROUBLE HERE!



A screw products company in Cuyahoga Falls, Ohio, called on Cities Service for advice on machining a part of an intricate mechanism made of aluminum that required extreme accuracy and finish. Chillo Oil No. 22 was recommended. Thereafter, the manufacturer reported the machined work was not only well within the required tolerances, but the work had a mirror-like finish. Tool life was also phenomenally good.

A brick and tile company in Iowa suffered numerous failures of the main drive-shaft bearings in their Hammer Mill Crushers. Cities Service engineers recommended Pacemaker Oil No. 2. The last report from the company said that since they standardized on this lubricant, no bearing failures have occurred.

"We use Solvent No. 26 for cleaning surplus oil and grease out of electric clock movements and we find it unexcelled for this purpose" ...so writes the president of an Illinois watch repairing and rebuilding concern after continued use of this remarkable new Cities Service metal cleaning fluid.

A bus company executive in Cleveland, Ohio, recently said, "During the past four years, we used Cities Service Heavy Duty type oil with outstanding results—minimum wear, freedom from sludge and no engine failures—which has enabled us to give uninterrupted service to our customers."

CITIES SERVICE OIL CO.
New York—Chicago

CITIES SERVICE

ARKANSAS FUEL OIL CO.
Shreveport, La.

Cities Service Oil Company
Room 271 Sixty Wall Tower
New York 5, N. Y.

Gentlemen: I have a production problem that involves lubrication. I would like to discuss it with one of your lubrication engineers, without obligation, of course.

NAME_____

COMPANY_____

ADDRESS_____

CITY_____ STATE_____

Part is a tread pin, 18 in. long by 1⅜-in. dia. Material is SAE-1045 cold-rolled steel. Requirements are 50-55 Rockwell "C" at surface, ⅛-in. depth of case, without changing core structure.

Manufacturer is U. S. Axle Co. Pottstown, Pa.

ONE 18" PIN EVERY 3 MIN.

SURFACE HARDENED TO 52 R "C" by High-Frequency Heating

This tread pin is an example of one advantage of high-frequency heating—obtaining a uniformly hard surface and ductile core without resorting to alloy steel or carburizing.

Pins are progressively surface hardened to 1/8-inch depth at 6 inches per minute while rotated at 30 rpm. Surface is heated to 1550°F and immediately water quenched.

A surface hardness of 52 to 55 Rockwell "C" is obtained, while core remains at approximately 20. Warpage, over the 18 inches, is 1/32 inch or less. No finishing is required because of negligible scale. Working conditions are clean and cool, and since operation is automatic, an unskilled operator can produce excellent and uniform results.

The heating coil was developed by Lepel Laboratories for use with a 30-kw spark-gap converter. Manufacturer developed the motor-driven carriage, mounted on a Lepel quench tank, which provides the progressive feeding and rotation of the pin.

SOLDERING
BRAZING
HARDENING
ANNEALING
MELTING

The same Lepel Spark-gap Converter will handle any or all of these processes, usually with advantages similar to those given in this advertisement. Often this unit will prove substantially more economical than any other high-frequency generator—*particularly when heating non-ferrous or non-magnetic materials.* Changing from one job to another can be done in less than 5 minutes.

If you have any operation — on ferrous or non-ferrous materials — which you think might be handled by high-frequency heating, let us make a quick preliminary investigation. If promising, our engineers can run tests, on samples you supply, and report just what can be done. There is no obligation; inquiries are treated with strictest confidence.

A letter to us will bring you, as you prefer, our latest catalog or a call by a representative. Any description of part or process which you can give may enable us to furnish, immediately, specific helpful data. You can help us by mentioning this advertisement.

HARDEN

SOLDER

BRAZE

MELT

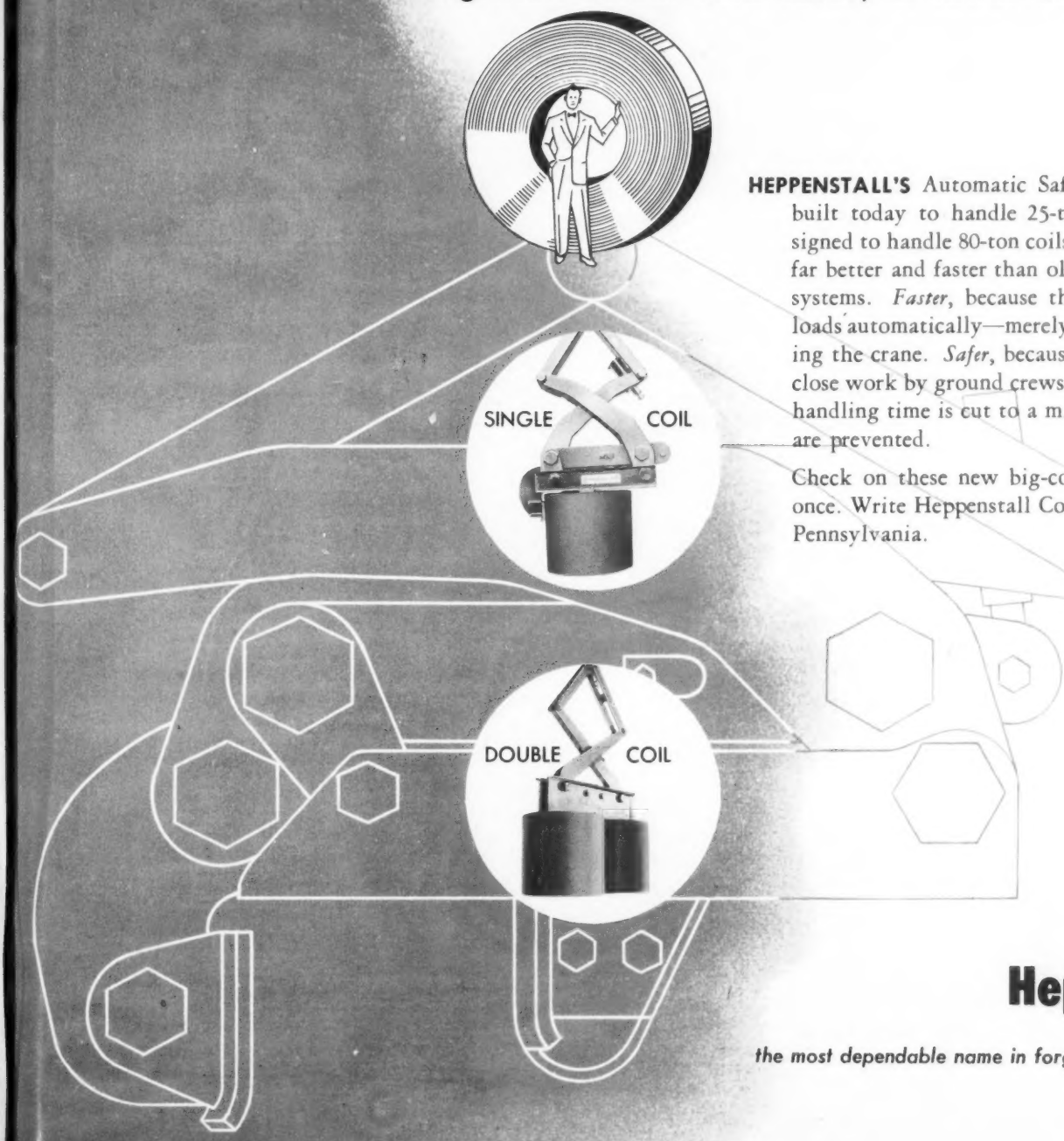
LEPEL HIGH FREQUENCY LABORATORIES
39 WEST 60th STREET, NEW YORK 23, N. Y.

Are you joining the swing to

Larger coils?

HEPPENSTALL AUTOMATIC SAFE-T-TONGS

will swing them faster and safer, *at lower cost!*



HEPPENSTALL'S Automatic Safe-T-Tongs are being built today to handle 25-ton coils—can be designed to handle 80-ton coils, or larger—and do it far better and faster than old-fashioned handling systems. *Faster*, because they grasp and release loads automatically—merely by raising and lowering the crane. *Safer*, because there is no need for close work by ground crews. *At lower cost*, because handling time is cut to a minimum and accidents are prevented.

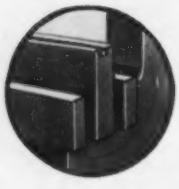
Check on these new big-coil handling tongs at once. Write Heppenstall Company, Pittsburgh 1, Pennsylvania.

Heppenstall

the most dependable name in forgings

Imagine! 8 Series *and* 36 DIFFERENT SIZES OF.. Dual

The amazing 2-way Dual Bolster makes them ideal for many jobs!



There's a Dual All Steel Press Brake for any plant... large or small! The versatile 2-way bolster makes it possible for them to do bending, forming, blanking and multiple punching. Dual doubles the efficiency of your plant... speeds up production!

Consult our Capable Staff of Engineers on your Production Problems!

Write Today!
For Illustrated Booklet!

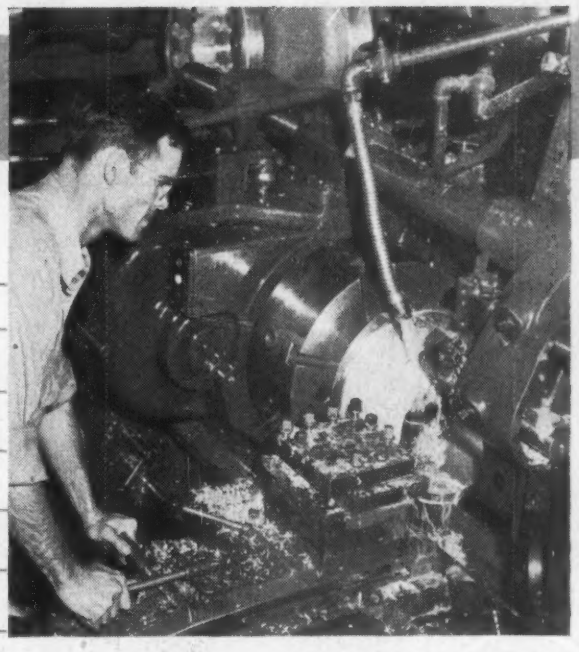
Dual PRESS COMPANY
2812 IOWA AVENUE • ST. LOUIS 18, MO.

Properties that *Count* in a soluble oil ✳

You get them all in

GULF SOLUBLE CUTTING OIL ✳

- ✳ Helps keep cutting tools sharp, grinding wheels clean
- ✳ Highly stable — in use or in storage
- ✳ Helps prevent gummy deposits
- ✳ Helps prevent rust
- ✳ Emulsifies readily with all but the hardest water
- ✳ Clean, pleasant odor — ready operator acceptance
- ✳ Nonfoaming



Facing and turning operation on steel forging, typical of the diversified machining jobs where Gulf Soluble Cutting Oil helps improve production and increase tool life.

THESE properties are combined in Gulf Soluble Cutting Oil to help you get greater production efficiency over a wide range of cutting, milling and grinding operations.

Call in a Gulf Lubrication Engineer and ask him to recommend the proper concentrations of Gulf Soluble Cutting Oil for your particular requirements. For further information on Gulf Soluble Cutting Oil—and for one of Gulf's practical slide-rule-type calculators, which will help you maintain desired soluble oil concentrations—send the coupon at right.

Gulf Oil Corporation · Gulf Refining Company

Division Sales Offices:

Boston • New York • Philadelphia • Pittsburgh • Atlanta
New Orleans • Houston • Louisville • Toledo

GULF INDUSTRIAL LUBRICATION

Gulf Oil Corporation · Gulf Refining Company S
3800 Gulf Building, Pittsburgh 30, Pa.

Please send me, without obligation, the material I have indicated below:

- ☐ Further information on the new Gulf Soluble Cutting Oil.
- ☐ Practical slide-rule-type calculator for help in maintaining desired soluble oil concentrations.

Name.....

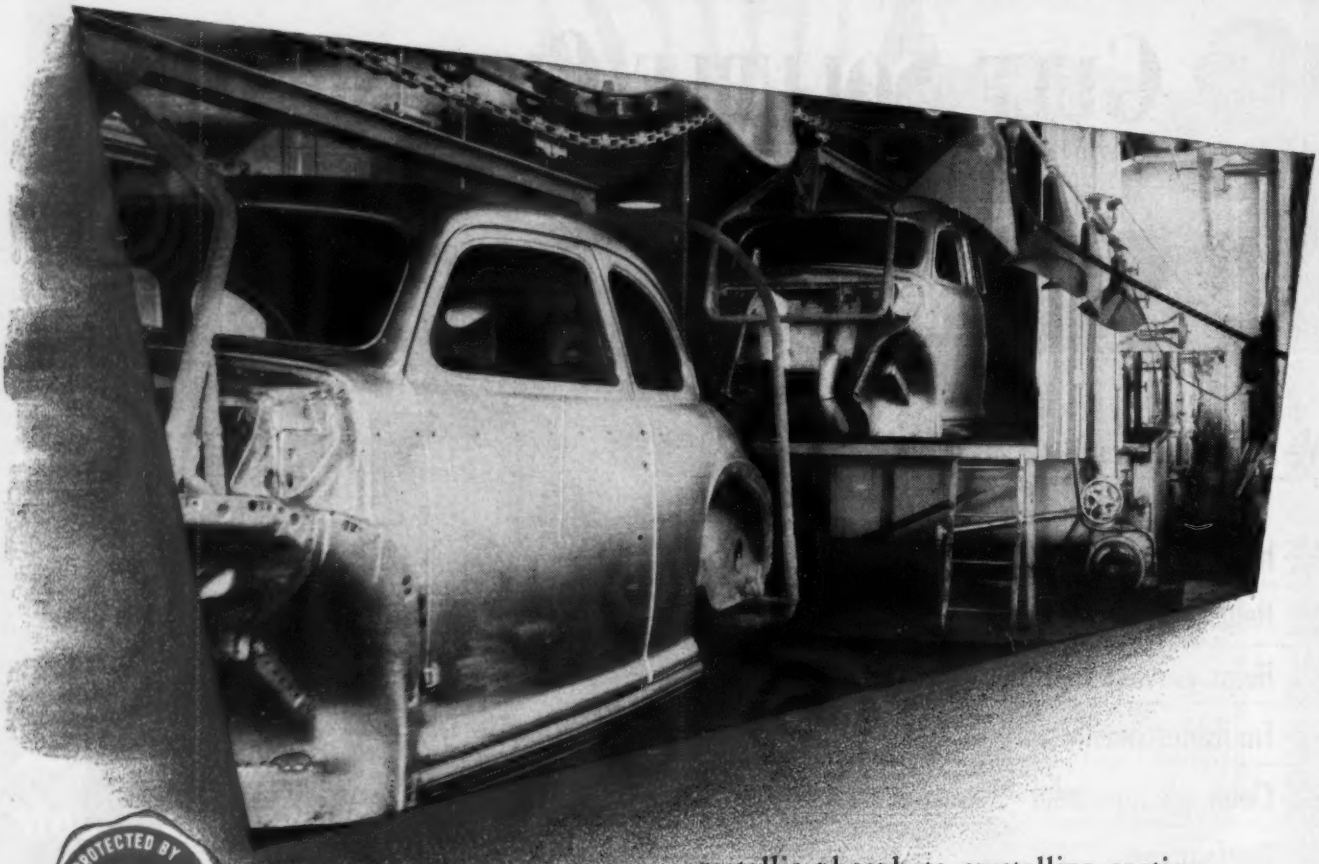
Company.....

Title.....

Address.....

BONDERIZING

..the start of the automobile's fine finish



PROTECTED BY Bonderite HOLDS PAINT AS NEVER FOR CORROSION RESISTANCE

Before the prime coat and the sprayed and baked finish coats, comes the trip through the Bonderizing line. Here bodies, fenders, and sheet metal parts get the treatment which protects and preserves the appearance of the final finish.

This effective, fast, economical treatment is used on most cars, trucks, and buses manufactured today. Bonderizing changes the surface of metal to a non-metallic phosphate crystalline coating which is a perfect base for paint. In addition, it affords good protection from rust and corrosion, retards the spread of finish failure around accidental breaks in the paint film, promotes lasting fine appearance.

Bonderizing costs far less than its value as a product improvement and sales feature.

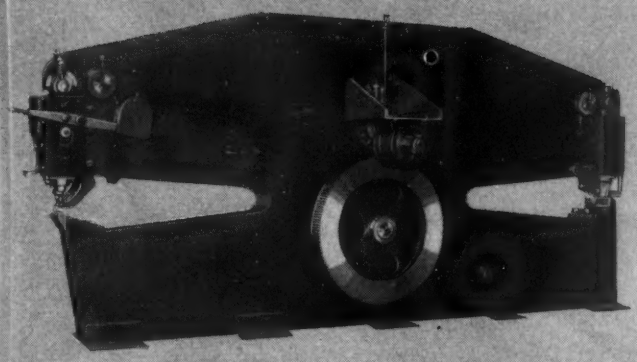
Investigate Bonderizing as protection for the fine finish of *your* product!

PARKER RUST PROOF COMPANY, 2158 East Milwaukee Ave., Detroit 11, Michigan

BONDERIZING	PARKER PROCESSES	PARKERIZING	PARKER PROCESSES	PARCO LUBRIZING
Holds Paint to Metal		Inhibits Rust		Retards Wear on Friction Surfaces

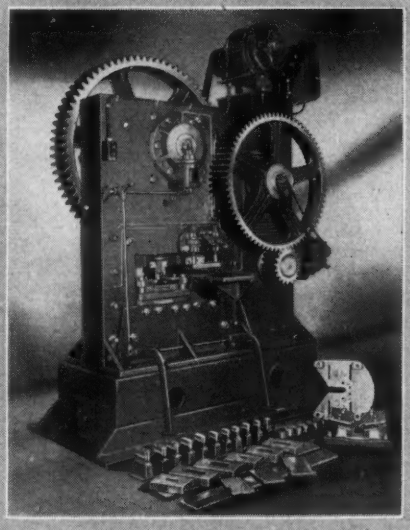
Bonderite, Parco, Parco Lubrite—Reg. U. S. Pat. Off.

"Special Purpose" Machines for cost-cutting —



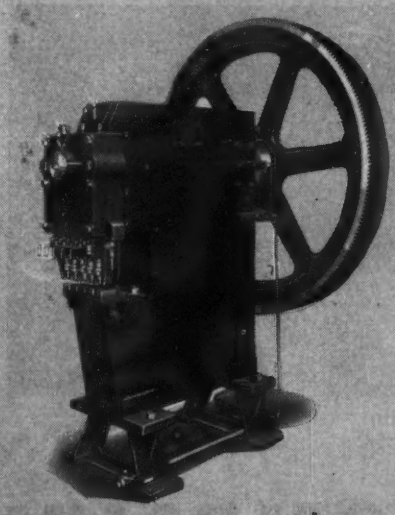
"BUFFALO" DOUBLE END PUNCHES AND SHEARS

This heavy fabrication "specialist" at left handles punching, shearing, notching of angles, tees, channels, flats, other plate work. Punching end and shearing end can be operated simultaneously. Full-floating heads permit lowering blades to work for accurate positioning of work. Die attachments for working very close to corners in punching webs or flanges. Direct or pulley driven, in number of sizes and throat depths up to 72". Write for Bulletin 304-F.



"BUFFALO" LOCOMOTIVE SHEARS

These brand new shears were developed specifically for the Railroad Industry. Of typically sturdy, rigid "Buffalo" construction, they are accurate, fast power tools for spring leaf fabrication in locomotive construction. Write us for all engineering data on this new production aid.



"BUFFALO" RAPID ACTING PUNCHES

"Buffalo" Rapid Acting Punches are equally effective on small lot punching, or regular production work. Photo at left shows Special Quintuple Attachment on a Rapid Acting Punch with 12" throat, for unusually high production speeds. In six sizes, including capacities of ⅜" x ¼" to 1" x 1" and throat depths from 12" to 72". Bulletin 318-C gives you complete facts.

BUFFALO FORGE COMPANY

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

158 Mortimer Street **Buffalo, N. Y.**

"Buffalo"

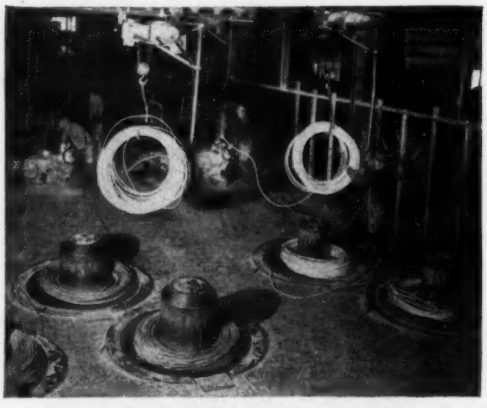
PUNCHES, SHEARS BAR CUTTERS

LITTLE RIVETS DO BIG JOBS for RAILROADS

DID YOU KNOW *that Buffalo Bolt has its own wire drawing department, a section of which is illustrated.*

● The latest streamlined designs for rail equipment call for lighter, stronger parts and materials. These demands are met, insofar as fasteners are concerned, by Circle Ⓑ Products such as the Button Head Rivet illustrated which is specified by leading rail equipment builders.

Fasteners bearing the Circle Ⓑ trademark not only meet rigid specifications on strength-weight basis, but are noted for their uniform size and long dependable service. These characteristics make it worthwhile to specify Circle Ⓑ Products when selecting fasteners for your products.



Ⓑ BUFFALO BOLT COMPANY

NORTH TONAWANDA, N. Y. • SALES OFFICES IN PRINCIPAL CITIES

Export Sales Office: Buffalo International Corp., 50 Church Street, New York City

DRAW THE LINE ON HIGH-COST FINISHING LABOR

with Permanent-Mold Castings of American Magnesium!

AND GAIN A BONUS IN LIGHTNESS!

The hours of high-cost labor required for rough machining, finish machining, and finish grinding are reduced to a fraction with permanent-mold castings of American Magnesium. Made to close limits, they machine easily, at high speed. The first cut is usually the finish cut.

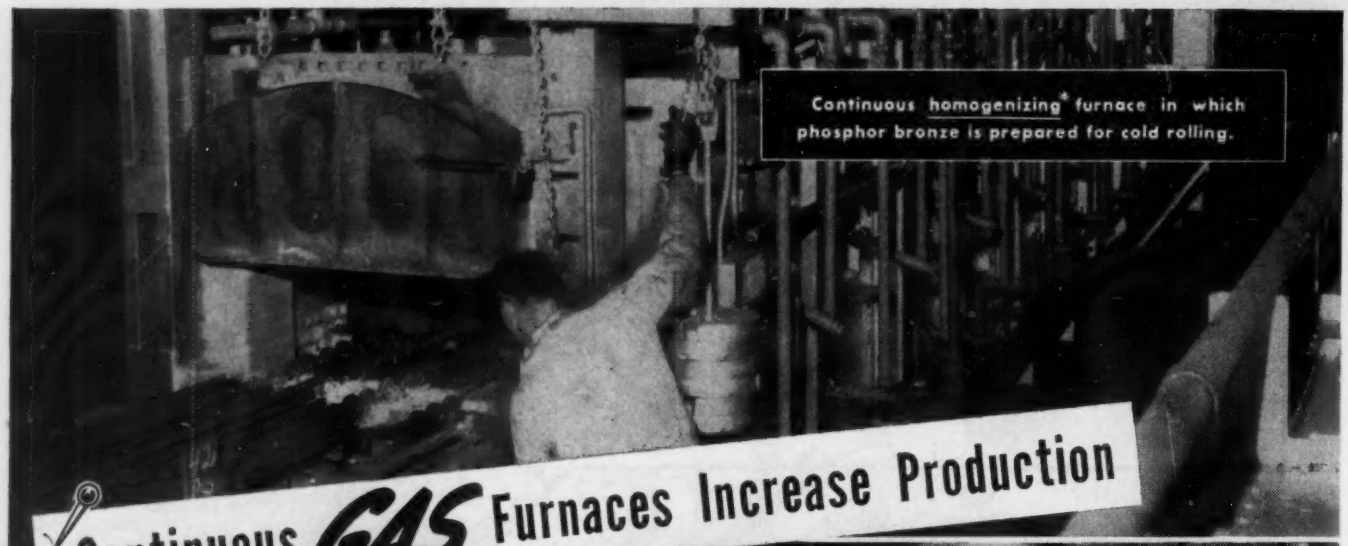
In addition, your product gains a bonus in lightness, for American Magnesium is 35% lighter than aluminum, 75% lighter than steel!

These advantages mean actual labor savings in hundreds of dollars. And the 59 years of light-metal know-how of Aluminum Company of America are ready to help you take full advantage of them. Call your nearest Alcoa sales office, or write ALUMINUM COMPANY OF AMERICA, sales agent for American Magnesium Products, 1721 Gulf Bldg., Pittsburgh 19, Pennsylvania.

MAGNESIUM MAZLO Reg. U.S. Pat. Off. PRODUCTS

AMERICAN MAGNESIUM CORPORATION

SUBSIDIARY OF ALUMINUM COMPANY OF AMERICA

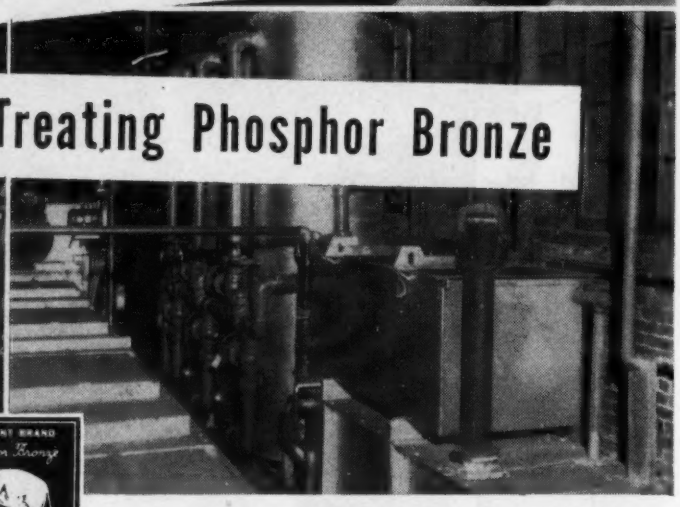


Continuous homogenizing* furnace in which phosphor bronze is prepared for cold rolling.

Continuous GAS Furnaces Increase Production

Reduce Cost of Heat Treating Phosphor Bronze

Roller hearth radiant tube heated furnace using prepared atmosphere for bright annealing.



Atmosphere generating equipment used with bright annealing furnace.

Customers of Phosphor Bronze Smelting Company, 2200 Washington Ave., Philadelphia, started the whole thing—they demanded more Elephant Brand Phosphor Bronze products than the company could produce by former methods of heat treating.

So company production engineers, already familiar with GAS and Gas Equipment, specified the modern method of heat treating—with continuous, automatically-controlled, Gas Furnaces, with integral prepared atmospheres.

Here are the processes . . .

Process—*Homogenizing—a method of heat treating to develop uniform grain structure in phosphor bronze billets prior to rolling, while relieving casting strains.
Temperature—1200° F.
Cycle—6 hours
Furnace Capacity—2000 lbs. per hour

Process—Annealing of bars and sheets in a prepared-atmosphere furnace to retain brightness while relieving stresses set up during rolling or drawing operations.
Temperature—1200° F.
Cycle—40 minutes to 3 hours, varying with stock size
Furnace Capacity—5000 lbs. per hour

Here are the results . . . .

1. Pickling process eliminated
2. Production increased 80%
3. Uniformity of heat treatment assured by automatic control
4. Annealing and homogenizing costs reduced over 50%
5. Working conditions improved

Processes and results like these are worth investigating regardless of the heat treating problem in your production line; your local Gas Company Representative can be of real assistance.

METAL SHOW CHICAGO Oct. 18-24 — VISIT A. G. A. COMBINED INDUSTRIAL GAS EXHIBIT

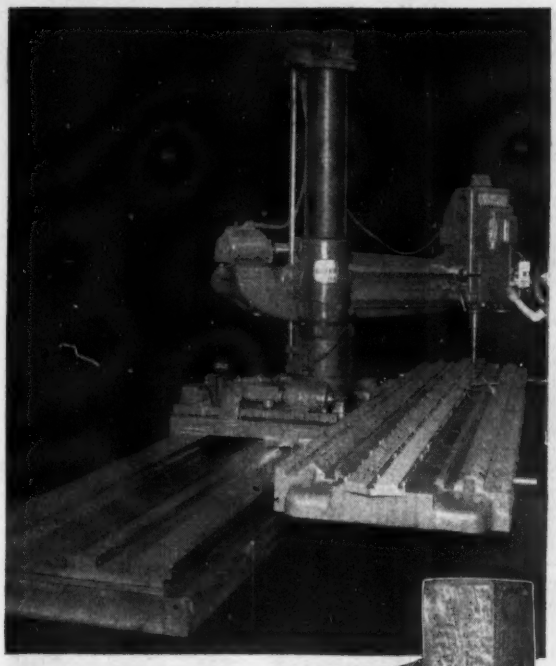
AMERICAN GAS ASSOCIATION

420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

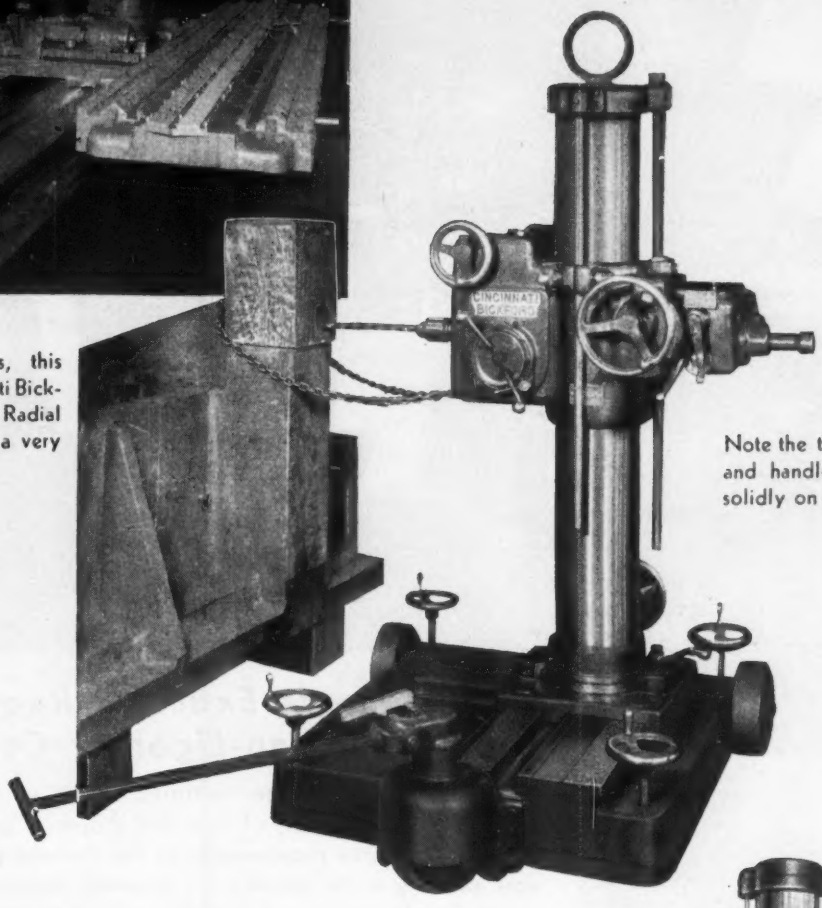
MORE AND MORE... THE TREND IS TO GAS FOR ALL INDUSTRIAL HEATING

Profitable Applications

of Traveling BICKFORD Radial Drills

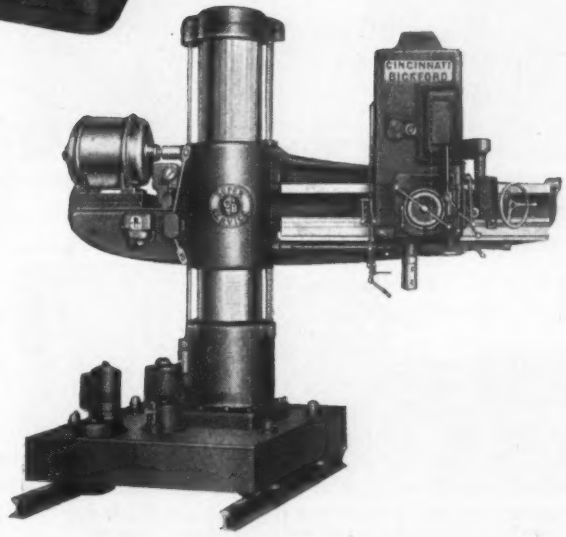


Mounted on ways, this sliding base Cincinnati Bickford Super Service Radial Drill is working on a very long casting.



Note the three-wheel base is easily moved and handled—in operation the base rests solidly on 4 leveling screws.

Moved by power, this track mounted Cincinnati Bickford Super Service Radial Drill has an unusually heavy base, rolling on hardened steel wheels.



When it is an advantage to move the drill to the work, Cincinnati Bickford Super Service Radial Drills, in various sizes and styles, are equipped for this service.

The "Portable Horizontal" is an inexpensive, 100% mobile machine, and offers great advantages on work within its range.

Powered with a 1½ horsepower motor, the base is equipped with leveling screws and built-in levels. Very handy; is easily rolled along the floor or moved by crane.

Large, cumbersome castings are being profitably handled by Cincinnati Bickford Super Service Radial Drills.

Write for Bulletin H-R, on the Horizontal Radial, or let us consult with you on your drilling problems on large castings.

See our Condensed Catalog in Sweet's File.

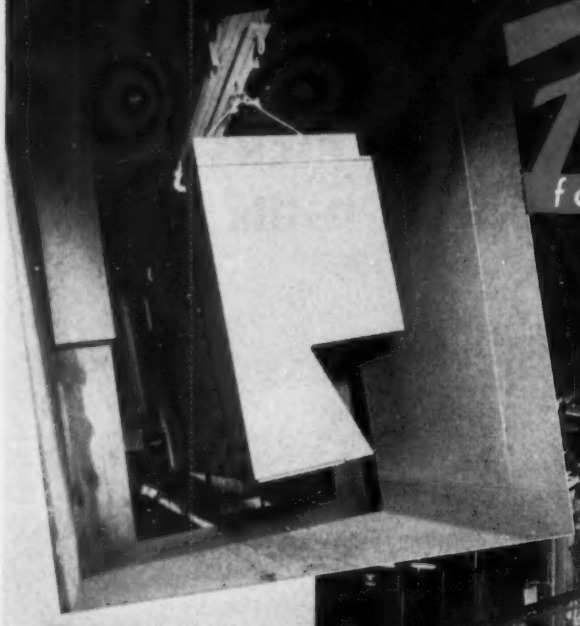
Equal Efficiency of Every Unit Makes the Balanced Machine.

RADIAL AND UPRIGHT SUPER SERVICE DRILLING MACHINES

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.

COMPLETE *Finishing* SYSTEMS

for ENAMEL • LACQUER • PAINT



Above: A Large Cold Display Case leaving the Dry-off Oven in the Complete Mahon Finishing System at the Hussmann-Ligonier Plant, St. Louis, Mo. At Right: General view of the Same Installation Showing Diversity of Parts and Products Handled. Note Up-Tunnel to Finish Drying Oven Located on Roof of Plant.

Typical Mahon Hydro-Filter Spray Booths in the Hussmann-Ligonier Installation. Swivel Attachments on Conveyor Line Permit Turning and Painting of Both Sides of Cases Twelve Foot Long. Parts Seven Foot in Height are also Handled in the Same Mahon Spray Booths.

Mahon Finish Drying Oven—Part of the Hussmann-Ligonier Installation—is located on the Roof of the Plant to Conserve Valuable Manufacturing Floor Space.

Mahon Meets Exacting Requirements of Hussmann-Ligonier Company

The Mahon Finishing System illustrated here is an unusual installation due to the wide diversity of sizes and shapes of parts and products handled—and, the requirements of the finishing process being the most exacting in the industry . . . exacting, because of the extreme conditions of grease and humidity under which products like cold display cases serve in butcher shops, and the extreme low temperatures, humidity and corrosive elements ever present in ice cream cabinets in commercial use. It is only natural that the Hussmann-Ligonier Company should turn to Mahon for equipment to meet these exacting requirements in product finish, because, over twenty-five years' experience in this highly specialized field has endowed Mahon engineers with a wealth of technical knowledge and practical know-how not available elsewhere. See Mahon Insert in Sweet's Mechanical Industries File, or

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Martempering Hypoeutectoid Steel

STEEL

The Magazine of Metalworking and Metalproducing

VOL. 121, NO. 15 OCTOBER 13, 1947

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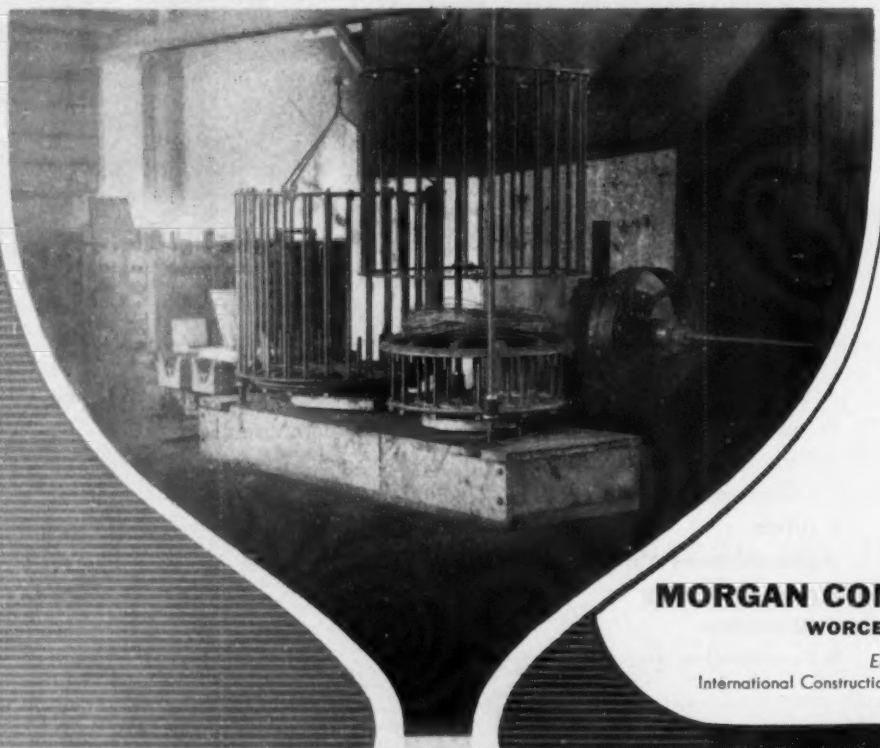

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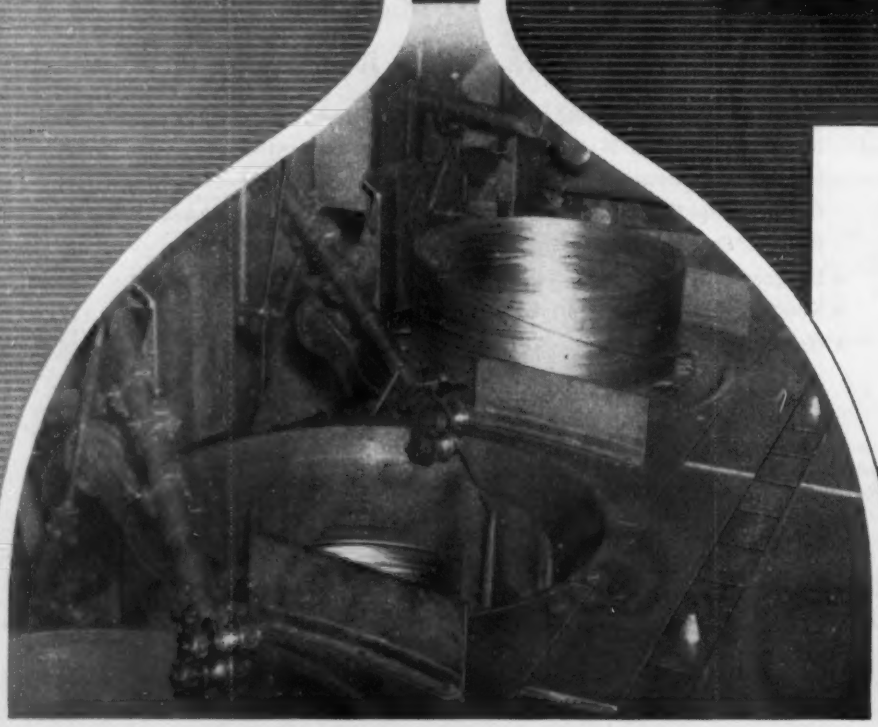

ABOVE . . . MORGAN'S MODERN POURING REEL

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RM-15

October 13, 1947

Margins of Safety

Last week on this page we were discussing the fact that the American public is not too well informed as to the losses incurred by this nation in World War II. Although we spent roughly $600 billion in waging war, many of the losses which have weakened our economy severely still are invisible to the casual observer.

This week it may be profitable to document last week's discussion with tangible evidence from current events. For example, consider the present outlook for raw materials required by the metalworking industries.

With about eight weeks to go before the lake shipping season closes, iron ore men are concerned as to whether enough iron ore can be brought to lower lake ports to carry furnaces through to the opening of navigation in the spring. With the best of luck as to weather, the margin of safety will be thin.

Samuel Weiss, executive secretary of the American Coke & Coal Chemicals Institute, told gray iron foundrymen that the quality of coke has slipped and it is unlikely that we shall ever get back to the quality available prior to 1935. The reason is that we have skimmed the cream from the nation's supply of good coking coal.

E. C. Barringer, executive secretary of the Institute of Scrap Iron & Steel Inc., told the foundrymen the scrap industry hopes to get through the winter without any shutdowns of steelworks or foundries because of lack of scrap, but that it will be a tight squeeze.

During the week E. T. Weir, chairman of National Steel Corp., pointed out that expansion of pig iron or steel ingot capacity at this stage involves expansion in raw materials sources, going back to mining operations and transportation.

All of this adds up to the cold fact that the war wiped out most of our margins of safety from mine to finished product. This is an important, although invisible, loss that must be reckoned with in our plans for expansion for the present or future. We should realize that we must do a tremendous amount of development work in many raw material lines before we can hope to support expanded production capacity with adequate supplies and with the minimum margins of safety required for uninterrupted operation.

* * *

DELAY IS DANGEROUS: If the Marshall Plan is as important as it seems to be, our government is making a serious mistake in not selling it to Congress and to the public more vigorously.

We have been told that the entire program calls for around $22 billion to be spent in four years from 1948 to 1951. Meanwhile President Truman will ask for $580 million for stop-gap relief for Europe until the longer-range Marshall Plan can become effective.

Action on both plans is painfully slow. Because the details as to what is urgently needed by European nations are vague, committees composed of able men are stymied in their work of preparing for the Marshall Plan. The President's Committee on Foreign Aid has been forced to postpone from Oct. 1 to Nov. 1 the deadline for drawing up a plan for what is to be shipped to Europe. The Office of International Trade has decided to delay fixing fourth-quarter steel allocations until they can be tied in with the aid-to-Europe program.

These delays not only threaten to make the

(OVER)

aid-to-Europe program too little and too late but they also complicate our domestic problem of supply and demand, because whatever goes to Europe must be subtracted from domestic consumption. More positive leadership at the top would help this situation tremendously.

—pp. 65, 69

* * *

DIVERSIFICATION, 1947: At technical sessions of the Army Ordnance Association emphasis was placed upon the policy of machinery manufacturers in pushing three lines of product development simultaneously. The three are (1) original prewar products, further expanded and developed; (2) new "diversification" products, tapping new markets having different buying cycles; and (3) government military requirements, many of which are expanding into new fields.

Nos. 1 and 3 are naturals. Machinery manufacturers automatically improve old lines and meet the challenge of new demands in their established fields. As for diversification, this is not new. Manufacturers have gone in for diversification enthusiastically after every prolonged spell of capacity operations. They seek greater stability by putting their eggs in more baskets. The thing that distinguishes the present urge for diversification from previous attempts is that today the movement is more widespread, more carefully planned and probably has a better chance of success. —p. 60

* * *

LIGHT ON CORROSION: Carbon steel usually is not regarded as a corrosion-resistant material yet in certain services, such as in oil-well equipment, the protective nature of solid corrosion products formed on the surface of the steel retards corrosion appreciably. If the corrosion film could be made uniform over the entire surface of the steel, the life of the equipment could be extended considerably.

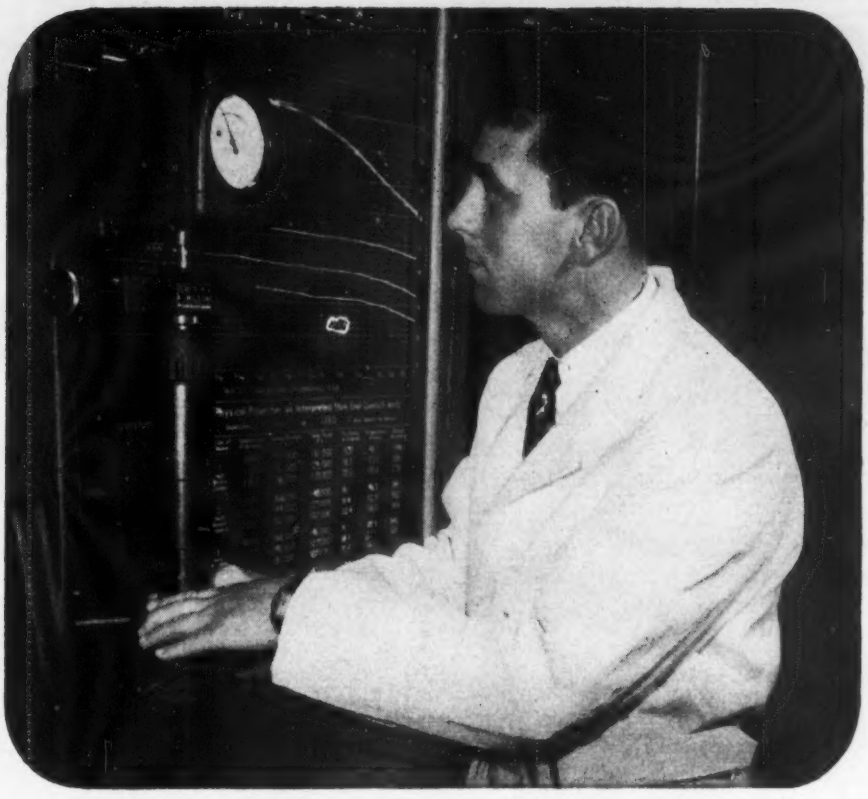
Corrosion failures usually result from localized attack. The upset ends of oil-well tubing are particularly vulnerable. Extensive research now reveals that the critical factor determining severity of corrosion on the upset band of metal is its carbide structure.

Apparently too little attention has been given in the past to carbide structure in evaluating the corrosion resistance of steels. Here is a new field to be explored. Research in it may shed new light on some heretofore unexplained mysteries of corrosion. —p. 82

SIGNS OF THE TIMES: Sales of ball and roller bearings averaged more than $20 million a month during the first three quarters of 1947. This volume (p. 60) is at a rate 250 per cent above annual gross sales in prewar 1937. . . . Munitions Board, which two years ago set $2.1 billion as the amount required for a minimum stockpile of critical war materials, now is talking in terms of from $2.5 to $3 billion for stockpiling. Reasons for upping the estimate (p. 56) are price increases and the addition of a number of materials to be stockpiled. . . . Discussion at the annual meeting of the Association of Iron & Steel Engineers in regard to the use of oxygen enriched air in open-hearth furnaces (p. 97) stressed the desirability of finding a better means of introducing oxygen into the bath and of attaining longer life of roof refractories. In discussing progress of high top pressure operation of blast furnaces (p. 100) engineers pointed out that the majority of mechanical alterations necessary to convert a blast furnace and plant for high top pressure operation are easy to engineer and to construct and, exclusive of blowing equipment, are inexpensive, averaging not over $125,000. . . . International Harvester Co. this month is observing its 100th anniversary (p. 72); Wallingford Steel Co., sudsidiary of Allegheny Ludlum Steel Corp., last week celebrated its 25th anniversary; and American Rolling Mill Co. held open house at its Butler, Pa., plant in honor of the company's 20th anniversary at that location. . . . Of 1000 dispute cases assigned to conciliators by the new Federal Mediation & Conciliation Service from July 24 through Sept. 18 (p. 62), 18 per cent were dropped without any action because the cases involved intrastate rather than interstate commerce, because state or local conciliation services were available or because the cases were not admissible under the Taft-Hartley Act. The record is in sharp contrast to that of the old United States Conciliation Service of never dropping a single case. . . . The Army announces that materials resulting from the partial scrapping of the United States share of the former Japanese fleet will be offered for sale in Japan (p. 65) and that purchasers of such scrap will be required to return it to the United States.

E. L. Shaner

EDITOR-IN-CHIEF



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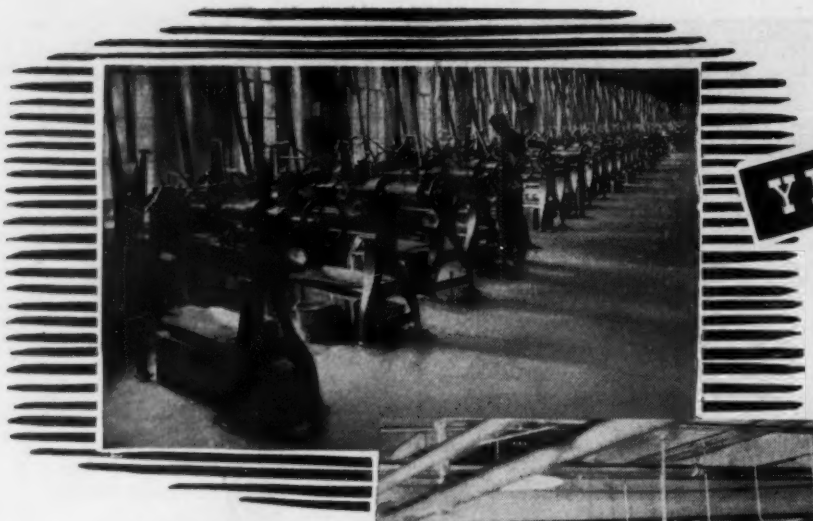

YESTERDAY...

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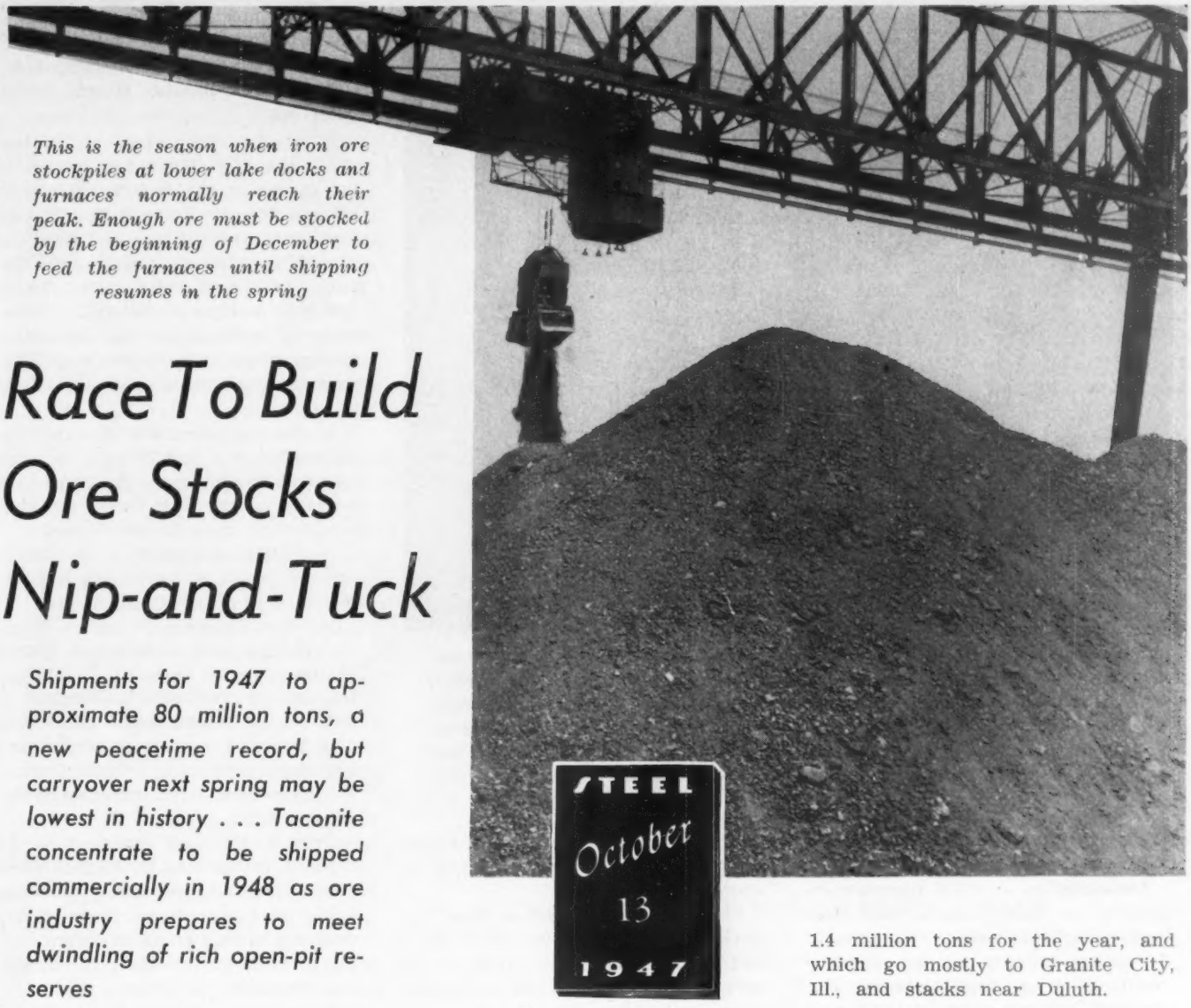


This is the season when iron ore stockpiles at lower lake docks and furnaces normally reach their peak. Enough ore must be stocked by the beginning of December to feed the furnaces until shipping resumes in the spring

Race To Build Ore Stocks Nip-and-Tuck

Shipments for 1947 to approximate 80 million tons, a new peacetime record, but carryover next spring may be lowest in history . . . Taconite concentrate to be shipped commercially in 1948 as ore industry prepares to meet dwindling of rich open-pit reserves

STORMY weather soon will begin to slow the movement of the Great Lakes bulk fleet now engaged in a nip-and-tuck race to bring down sufficient iron ore to feed the northern blast furnaces over the winter. By early December, the last of the large freighters will have gone to winter berths and no more ore can be moved until the 1948 season opens, probably in April.

Will this season's shipments be adequate to keep the furnaces going until the fleet takes to the lakes again next spring? The answer to this question, depending to large extent on the weather this fall, will have a profound effect on the operations of the thousands of metalworking companies, already hard pressed for steel supplies. It is causing considerable concern among steelmakers and ore houses.

Peacetime Record—Come hell or high water on the lakes, shipments this year will be the highest for any peacetime season. With possibly eight weeks to go, the movement to date exceeds 65 million tons, exceeding that for all 1946 and approaching the best year prior to 1941 (66,902,778 tons in 1916).

But new peacetime highs do not necessarily mean adequacy.

Prospects—Ore shippers now expect total shipments to be somewhat under 80 million tons, although there remains a possibility that this figure may be reached. On Oct. 1, lake shipments aggregated 61.7 million tons. Given the most favorable conditions, October should see another 10 million tons loaded and November possibly 8 million tons. This would leave only a couple hundred thousand tons to be shipped in the first days of December to bring the season's mark up to 80 million tons. That is the best the most optimistic persons in the ore trade are hoping for.

More conservative members are guessing the season will end on about 77 million tons.

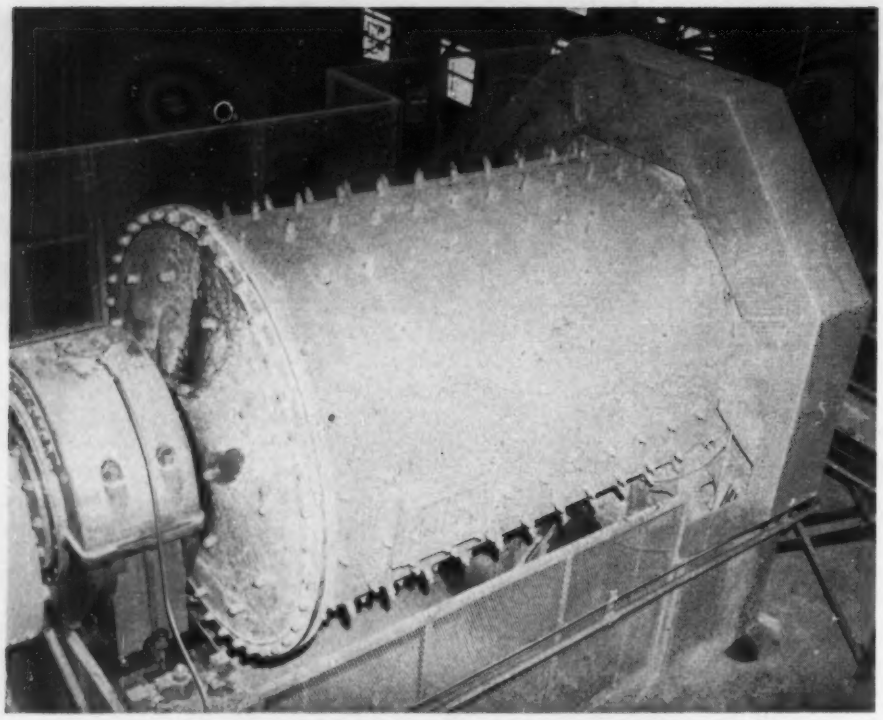
These figures do not include the all-rail shipments which may reach 1.4 million tons for the year, and which go mostly to Granite City, Ill., and stacks near Duluth.

Unpredictables — Shippers' hopes for reaching their goal are predicated on the most favorable conditions to the early part of December. Three factors may upset the expectations.

1. Weather—Autumnal storms on the lakes may delay the freighters; cold may hinder beneficiation plants and cause the ore to freeze before loading or in transit. Ships running up the lakes light may be forced to seek shelter from blows that would not bother a loaded vessel.

2. Grain—Diversion of bulk freighters to haul wheat down the lakes generally is a problem to ore shippers in late season. With the European relief issue approaching a climax, the demands for vessels to haul grain may be greater than now anticipated.

3. Coal—Normally, bulk freighters haul coal up the lakes. When the pressure for ore is great, however, they may run light on the upward trip, thus saving up to 2½ days per trip, counting loading and unloading of the coal cargo and faster running time. If coal demand from the upper



Iron ore mines in the Adirondacks, which supplied the iron to make Revolutionary War cannon, are taking on renewed importance in the face of dwindling reserves of open pit ore in Minnesota. Republic Steel Corp. maintains a modern concentrating plant here, annually ships about 1,500,000 tons of ore and concentrates. Shown above is an 8 x 12-ft rod mill which crushes crude ore in the beneficiation process

lakes is heavy, light upward-bound ships may not be permitted.

Consumption — Blast furnaces depending on Lake Superior ore have been using the material at close to 7 million tons a month; January consumption exceeded this figure. For the first eight months of 1947, consumption totaled 53,024,888 tons, or at a rate of about 80 million tons a year. This rate of consumption is unlikely to show much change over the winter months.

For The Winter — Should no unusual difficulties be encountered before the shipping season ends, iron ore stocks at lower lake docks and furnaces on Dec. 1 should approximate 43 million tons. Blast furnaces will require 33 to 34 million tons to May 1, indicating lower lake stocks on that date would be no more than 10 million tons—not counting whatever may be shipped next April. Should late season difficulties be encountered and the season's movement be held to around 77 million tons, the Dec. 1 stocks would be about 40 million tons and the indicated carryover, exclusive of April shipments, about 7 million tons.

While this may appear on the surface to afford a safe margin, actually it would be dangerously low. A carryover of even the higher figure would mean that some furnaces would run out of needed grades of ore and that swaps and transfers would be necessary if the stacks were to be kept in operation.

This year, about 13.5 million tons were on hand at lower lake docks and furnaces on May 1, the lowest carryover for many years. Usually more than 15 million tons are on hand when the new shipping season gets under way.

Touch-And-Go — While deep concern over the short ore stocks is evident among iron and ore men, they indicate there is no cause for great alarm. Ore men have been known to boast that a shortage of Lake Superior ore never has been responsible for the banking of any blast furnaces and this contributes—possibly falsely—to a feeling of security. However, some representatives of the industry admit they would feel a lot better were the 1947 movement to amount to 84 million tons, instead of a doubtful 80 million.

Should blast furnace operations continue at the rate of recent months, shortages of certain grades of ore at some furnaces will develop next spring. To what extent these needs can be filled by loans and trades among blast furnace operators remains to be seen.

Ore For The Future—While supplying adequate tonnages of lake ore for the coming months is of the most immediate concern to the ore interests, plenty of thought is being given to the long-term future. What is to be done when the rich, near-surface ores in the Mesabi range peter out?

When America paused at the end of World War II to take count of her resources, the fact that her richest ore deposits had taken a terrific beating during the war and were approaching exhaustion broke upon the public with a startling impact. There followed many sensational stories, some of which made the exhaustion of high-grade Lake Superior ores appear more imminent than actually is the case.

It was suggested that the steel industry shortly would have to pull up its stakes and move to the eastern seaboard or the Gulf Coast, where it would feed upon imported ores.

Immediate construction on a huge scale of plants to beneficiate presently unusable ores was mentioned.

New ore explorations in the Western Hemisphere outside the United States attracted tremendous interest. Reports of veritable mountains of rich ore in Labrador and Brazil and of substantial deposits in Mexico and Venezuela relieved to a limited extent the uneasiness over our own dwindling supply.

Greater attention attached to ore deposits in the East and other parts of the United States, many of which had proved unprofitable for extensive working as long as an abundant supply of open pit ore from the Mesabi was available.

Research — Men in the large ore houses at Cleveland and on the upper lakes' ore ranges long have recognized the need for supplementing the known reserves of presently merchantable ore. Research on beneficiation processes has been proceeding for years. Due attention has been given to the possibilities of developing ore fields outside the United States and to further development of the lesser deposits within our boundaries.

The abundance of the rich and cheap Mesabi ores, combined with tax policies of Minnesota which encouraged the mining of known reserves as rapidly as possible, created an economic situation which has held plans for the development of new ore sources to the blue print and pilot plant stages until recently. Concentrates couldn't compete with direct shipping of ore in the market place.

Beneficiation Plants — Greatest hopes for extending domestic supplies of iron lie in the beneficiation of the abundant iron-bearing rock of the Lake Superior district, known as taconite. All the major ore produc-

ing companies are engaged in research on the technical and economic problems of concentrating this to usable form. Several already have launched beneficiation plant construction programs and taconite concentrates will become a factor in the 1948 ore season.

Pickands Mather & Co., Cleveland, through a subsidiary, Erie Mining Co., is building a taconite beneficiation plant on the Mesabi range which is designed to produce 175,000 to 200,000 tons of concentrate annually. This is expected to be in operation next season and the concentrate reportedly will be smelted by three iron producers.

Oglebay-Norton & Co., through its Reserve Mining Co. subsidiary, is engaged in a multimillion dollar project at Beaver Bay, Minn., which will include a large taconite processing plant and other facilities. This project is being supported by Cleveland Cliffs Iron Co., Wheeling Steel Corp. and American Rolling Mill Co.

Oliver Mining Co., subsidiary of United States Steel Corp., which owns the lion's share of the rich Mesabi ores, has under way a $34 million program of research, construction and expansion.

Jones & Laughlin Steel Corp. last week opened its new ore research laboratory in Negaunee, Mich., adjacent to large holdings of underdeveloped ore.

Beneficiation of taconite is an expensive process by present methods. A plant capable of producing annually 1 million tons of concentrate would cost between $10 and $15 million. Power requirements are heavy, running from 60 to 80 kilowatt hours per ton. At present, this power must be derived from coal.

Ore researchers are hopeful their experiments eventually will result in cheaper methods, possibly a chemical beneficiating method, rather than the present mechanical crushing and grinding of the rock.

At any rate, the Lake Superior ore industry is confident that it can extend the life of these ores for an almost unlimited time through a normal evolutionary pattern.

Explorations—But the ore men are not placing all their bets on beneficiated ore. Leading mining companies are spending millions for the exploration and development of hitherto unworked deposits.

Among the most spectacular of these are in Labrador and Brazil. M. A. Hanna Co. of Cleveland is cooperating with the Hollinger mining interests in Canada in exploring the Labrador deposits, hailed by some as a new Mesabi. Before this ore can be brought out, a haul of 325 miles to the Gulf of St. Lawrence, large expenditures for mining facilities, power equipment and a railroad, estimated at in excess of $200 million, must be made. Also clouding this development is an uncertain political situation. Labrador is a dependency of Newfoundland, which as result of financial difficulties has surrendered its dominion status and become an economic ward of Great Britain.

The Itabira mines in Brazil offer great promise if they can be put to use. Both political and topographical difficulties lie in the path to their utilization, however. They are located more than 300 miles inland, in extremely rugged country. No adequate railroad facilities exist to bring out the ores, and construction of a new railroad would be difficult and expensive. United States companies are reluctant to put up the millions necessary for the development, with South American politics being what they are.

National Security—Several major objections are raised to too-great dependence on ores from outside the United States. One of these is national security. Imports of ores from Latin America were practically shut off during the war by German submarines and a number of large ore freighters lost. There can be little security in dependence on imported ores.

On the other hand, all ore and steel men remember the shivers caused during World War II by the thought of what a single bomb dropped on the Soo locks would mean.

Shifts—While some gradual migration of steelmaking facilities to the eastern and southern coastal areas may result from future development of foreign ore deposits, this is not likely to be as sudden or pronounced as indicated by some recent stories. Concentration of low-grade Lake Superior ores, greater development of the intermediate ores, intensification of the working of the northeastern ores, for which beneficiation processes are proved and established, plus some imports, will stave off abrupt dislocation of the steel and metalworking industry of the north central regions for many years to come.

Present, Past and Pending

■ JOSEPH L. TRECKER DIES OF HEART ATTACK

MILWAUKEE—Joseph L. Trecker, 45, president, Kearney & Trecker Corp., died at his desk of a heart attack Oct. 7. A former president of the National Machine Tool Builders' Association, he served the government in various capacities during the war, notably in the organization of subcontracting of war contracts. He was active in the American Gear Manufacturers Association, a member of the American Society of Mechanical Engineers and the American Society of Tool Engineers.

■ BRITISH STEEL OUTPUT SETS 4-YEAR RECORD

LONDON—Steel production in September was the highest ever recorded for that month and the highest for any month since March, 1943. Total output was 1,153,416 tons, an annual rate of 13,841,000 tons.

■ FACTORY EARNINGS INCREASE SLIGHTLY

WASHINGTON—Average weekly earning of factory workers rose slightly in August to $49.29, from $49.03 in July according to Bureau of Labor Statistics. Wages in durable goods industries averaged $52.49 in August.

■ CARNEGIE-ILLINOIS HITS POSTWAR HIGH

CHICAGO—With Chicago district plants setting the pace, a new weekly postwar production record has been established by Carnegie-Illinois Steel Corp. mills. Production in the week ended Oct. 4 totaled 403,641 tons, 102.2 per cent of theoretical capacity.

■ LUKENS SUBSIDIARIES BECOME DIVISIONS

COATESVILLE, PA.—By-Products Steel Corp. and Lukenweld Inc., wholly owned subsidiaries of Lukens Steel Co., will cease their corporate existence Nov. 1 and become divisions of Lukens.

■ ANNOUNCES FIRM PRICES ON CASTINGS

HAMILTON, O.—Hamilton Foundry & Machine Co. is continuing prices now in effect through the fourth quarter in the interest of stability of prices, President Peter E. Rentschler has announced.

Push Industrial Mobilization Plans

Munitions Board shaping up program for future emergencies. Twenty-seven industry committees already named. Stockpiling may be increased

Thomas J. Hargrave, right, president of Eastman Kodak Co., takes over the executive chairmanship of the Munitions Board at a time when the ominous international situation gives increased importance to the board's recently completed industrial mobilization plans

WASHINGTON

WITH the international situation almost daily growing more ominous, an activity of signal importance this fall and winter will be the polishing up of plans for the mobilization of industry if and at such time as the present political and ideological warfare goes into the shooting stage.

This activity is the primary job of the Army & Navy Munitions Board, now, under the National Security Act of 1947, known simply as the Munitions Board. The change became effective Sept. 30 when Thomas J. Hargrave was sworn in as executive chairman. In this capacity, Mr. Hargrave, the dynamic president of the Eastman Kodak Co., Rochester, N. Y., succeeds R. R. Deupree, head of the Procter & Gamble Co., Cincinnati.

Completes Final Draft—After two years of unremitting labor, the board has completed the final draft of its proposed Industrial Mobilization Plan. Copies of it have been sent to the White House, to the two Armed Services committees, to key government officials and certain other individuals for preliminary study. As soon as the board has had a chance to study such recommendations as are received from these sources, and to make revisions, copies then will be sent to some 80 leaders in industry and in some other pursuits. Included will be some of the men who played a leading part in mobilizing industry in World War II. Finally, the Munitions Board will submit the plan to its various industry advisory committees so that it may be adapted specifically to cover the special circumstances applying to each industry.

The plan as it now stands is described as a relatively short document "which can be read in about an hour's time." It is expected that when this plan has been put in final shape it will be made available for publication. However, the real "guts" of the plan will be in "appendices" and "annexes" which will be drawn up for each industry and each war material. These "appendices" and "annexes," it goes without saying, will be highly restricted.

Names 27 Committees—The Munitions Board so far has named 27 industry advisory committees and will set up some more. The total number of committees in existence by the end of this year probably will be between 35 and 40. First fall meeting was with the Aluminum & Magnesium Industry Advisory Committee on Oct. 10. This was largely an organizational meeting. Several conferences are slated for November, including an organizational session with the Iron & Steel Industry Advisory Committee (for the membership of the Iron & Steel Industry Advisory Committee see STEEL of June 30, 1947, p. 41).

The board, in preparing for a profitable session with the iron and steel industry representatives, is making studies of the problems incident to the supply of scrap and coke.

The board, whose personnel now numbers around 105 officers and civilian employees, is preparing to enlarge its present stockpiling program. So far, because of the shortage of ships, the difficulty of getting out production in foreign countries, and the needs of domestic industry in the United States during the reconversion phase, the board has spent only $107 million in the purchase of materials to be stockpiled. It shortly will begin purchasing certain materials like tin and lead which have been in acutely short supply for civilian needs.

Sets Sights Higher — The board two years ago set its sights on $2.1 billion as the size of the outlay necessary for a "minimum" stockpiling program. Now it is talking in terms of $2.5 to $3 billion. There are two reasons. One is the rise in prices generally. The other, and more important reason, is that more materials are to be stockpiled. To the critical and strategic list are being added a number of materials that were not used in World War II on any substantial scale but which are required in great volume for newly developed weapons.

The board also has completed a number of basic manuals on the chief national problems which will have to be handled in the event of another major war. One is on the use of manpower in a future war Another is on the WPB-type organization which will have to be created to direct industry. The third summarizes the controls that will be needed to keep the country's economy in hand during another war. Discussion of these manuals will be a feature of the com-

ing conferences with industry advisory committees.

Tantalizing Question—Incidentally, the Munitions Board is asked one question more than any other: Most industrialists are curious as to why it is that we pay out good American money for foreign materials to be stockpiled. They think it only reasonable that we should receive materials in at least partial payment for the aid we dispense abroad so lavishly — as, possibly, to obtain chromite and abrasive materials from Turkey in exchange for our aid to that country. To such questions Munitions Board spokesmen have no answer; the Munitions Board does not formulate foreign policy. Rather, such matters are in the province of the White House and the State Department.

ARGUMENT

"Talk of total tonnage shipped is not pertinent to the subject and is grossly misleading," states S. M. Felton, president of American Railway Car Institute, commenting on a statement by Walter S. Tower, president of American Iron & Steel Institute, that steel supply is not to blame for the lag in freight car building (STEEL, Oct. 6, p. 73.)

"Repeatedly the car builders have warned against lumping together quantities of steel delivered to shops, parts manufacturers and carbuilders and assuming that this steel is for use exclusively in new cars. We have stressed to the steel people that total tonnages of steel shipped to the car builders cannot be considered only as steel for new domestic freight cars.

"The only figures that have any bearing on the matter . . . . are the tonnages received for construction of new freight cars. As has been publicly pointed out, a recent survey of all car builders shows clearly that they have not received enough steel at any time to fulfill their portion of either a 7000- or a 10,000-car-per-month program."

Total of 7597 freight cars was built in September, however, comparing with 5963 in August and representing an increase of 154 per cent over January of this year.

Steel Industry Gets Until Nov. 1 To Answer in Basing Point Case

FEDERAL Trade Commission again has extended the time in which the American Iron & Steel Institute and its member steel companies may prepare answers to the commission's charge of Aug. 18 that steel prices are quoted and maintained by an illegal conspiracy. The industry now has until Nov. 1 to file its responses.

Reason for the postponement is the retention by the American Iron & Steel Institute of John W. Davis, one-time Democratic candidate for the Presidency, as counsel in this case. Mr. Davis said he needed more time to study the complaint and familiarize himself with pricing customs in the steel industry.

Cement Case Scheduled — Meanwhile it was learned last week that the U. S. Supreme Court on Oct. 20 and 21 will hear arguments in the Cement case which in many respects parallels the FTC's action against the steel industry.

The Federal Trade Commission is said to regard the Cement case as of paramount importance in its drive to outlaw all basing point pricing systems, and legal experts say that if the Supreme Court rules in favor of the commission in this case its complaint against the steel industry will be appreciably strengthened.

Metalworking industry executives, generally speaking, appear opposed to the Federal Trade Commission's attack on steel basing point pricing.

Recent survey by STEEL of trade association executives who are in position to speak authoritatively for their membership showed that almost without exception the durable goods manufacturing industries are convinced so-called f.o.b. mill pricing in steel, advocated by the FTC, would play havoc with steel distribution and result in serious economic dislocations (STEEL, Sept. 29, p. 45).

Steel Buyers Warned — Commenting on the basing point situation, the Pressed Metal Institute in a bulletin to its membership states that in event the FTC action in the Cement case is sustained by the Supreme Court, undoubtedly the commission, ignoring "the contention of many trade associations, manufacturers, and others, will continue to press the steel industry complaint, and if successful would likely add even more confusion to the already well-confused steel distribution pattern.

"It will be well to watch the outcome of the Cement case as it may point the way to the steel industry complaint, as well, and if the Federal Trade Commission prevails, a great many stamping plants and other metal fabricators may seek, eventually, more favorable sites closer to steel producing plants if they hope to successfully cope with the competition of the wholly-owned and advantageously located subsidiaries of the steel producing companies."

Tubular Goods Output in 1947 To Total 6 Million Tons, but Shortages Persist

PRODUCTION of steel tubular goods in 1947 is expected to total six million tons, within 400,000 tons of the output during the last full year of war, 1944, W. F. McConnor, vice president in charge of sales, National Tube Co., told the American Gas Association in its annual meeting last week in Cleveland.

That output would be considerably above the yearly average of 2,700,000 tons during 1931-1940 or 3,700,000 tons during 1937-1940. As the war came to conclusion, output in 1945 declined to six million tons. In the reconversion year of 1946, which also was affected by labor disturbances, output of tubular steel goods receded to five million tons.

Whereas tonnages during the war period were high because large quantities of bomb body tubing and rocket tubing were produced for the war effort, the high current output is due to a great extent to the exceptionally heavy demand for oil and gas transmission lines.

Estimates 1947 Output—Preliminary data for the first six months of 1947, says Mr. McConnor, indicate an annual production of six million tons. "However, there were critical shortages of natural gas and fuel oil last winter, and it appears the industry may experience such shortages again during the coming winter, with consequent curtailed steel

(*Please turn to Page* 168)

Outgoing and incoming directors of Gray Iron Founders' Society

Gray Iron Castings Output Gains Despite Raw Materials Shortages

Production at annual rate close to 13 million tons, 25 per cent greater than in 1946, delegates to convention of Gray Iron Founders' Society told. Howard A. Stockwell re-elected president of organization. Pig iron and coke discussed

DIFFICULTIES presented by the tight situation in raw material supplies received major attention of members of the Gray Iron Founders' Society during the organization's 19th annual meeting at Hotel Schroeder, Milwaukee, Oct. 2-3.

Despite shortages of pig iron, coke and scrap, shipments of gray iron castings so far this year have been at an annual rate of close to 13 million tons, or 25 per cent more than in 1946. In some instances this heavy output has permitted foundries to reduce order backlogs moderately.

The society's meeting was attended by aproximately 275 members and guests and was presided over by its president, Howard A. Stockwell, Barbour-Stockwell Co., Cambridge, Mass. At the election of officers Mr. Stockwell was named to a second term; Ronald E. Kucher, Olympic Foundry Co., Seattle, was re-elected vice president; Edward B. Smith, American Brake Shoe Co., New York, was re-elected secretary; and Henry J. Trenkamp, Ohio Foundry Co., Cleveland, was elected treasurer to succeed Homer Britton, Cleveland Foundry Co., Cleveland. Raymond L. Collier continues as executive vice president.

Directors chosen for varying length terms include, in addition to Mr. Kucher and Mr. Trenkamp, the following: J. E. I'Anson, Lincoln Foundry Corp., Los Angeles; Hermann P. Good, Textile Machine Works, Reading, Pa.; Sheldon P. Pufahl, Pufahl Foundry Inc., Minneapolis; and George F. Hutchins II, Standard Foundry Co., Worcester, Mass. Mr. Stockwell was elected a director at large.

Scrolls Awarded — Featuring the concluding session of the meeting was the awarding of illuminated scrolls to seven individuals in recognition of meritorious service to the foundry industry and the Gray Iron Founders' Society covering a period of many years. Recipients were: F. R. Hoadley, president, Farrel-Birmingham Co., Ansonia, Conn.; C. J. Miller, chairman, Fremont Foundry Co., Fremont, O.; H. L. Edinger, president, Barnett Foundry & Machine Co., Irvington, N. J.; E. T. Runge, Cleveland, leader of a number of the society's cost groups; John L. Carter, Newark, N. J., society cost accountant; E. B. Sherwin, president, Chicago Hardware Foundry Co., North Chicago, Ill.; and C. B. Magrath, president, Greenlee Foundry Co., Chicago. Messrs. Hoadley, Miller, Edinger and Magrath are past presidents of the society.

The outlook for foundry pig iron, foundry coke and cast scrap was discussed by three speakers at one of the three business sessions. Speaking on pig iron, B. S. Stephenson, president, Tonawanda Iron Corp., North Tonawanda, N. Y., stated that production of foundry and malleable grades this year has been at the highest rate since 1929, and the increase over 1946 matches the upturn in output of castings. Balance between supply and demand in foundry grades of pig iron may be nearer than is commonly believed, he added, although under existing circumstances there is little likelihood of any additional major increase in production. Wartime expansion in blast furnace capacity consisted almost entirely of large stacks connected with steelworks and provided little increase in tonnage of foundry iron.

Shortage Factors—Mr. Stephenson cited various factors which have combined to aggravate the pig iron shortage. These include the low level of inventories at the war's conclusion; the 1946 strikes which caused loss of more than a million tons of iron; the

IN THE PICTURE—(Front row, left to right): E. C. Hoenicke, Eaton Mfg. Co., Detroit; J. E. I'Anson, Lincoln Foundry Corp., Los Angeles; R. E. Kucher, Olympic Foundry Co., Seattle; H. A. Stockwell, Barbour-Stockwell Co., Cambridge, Mass.; E. B. Smith, American Brake Shoe Co., New York; Homer Britton, Cleveland Foundry Co., Cleveland.

(Second row, left to right): Hermann P. Good, Textile Machine Works, Reading, Pa.; C. T. Milles, C. H. Milles Foundry Co., Chicago; George F. Hutchins II, Standard Foundry Co., Worcester, Mass.; George Tisdale, Zenith Foundry Co., West Allis, Wis.; J. E. McIntyre, Sibley Machine & Foundry Co., South Bend, Ind.

(Third row, left to right): C. B. Magrath, Greenlee Foundry Co., Chicago; Henry J. Trenkamp, Ohio Foundry Co., Cleveland; S. D. Russell, Phoenix Iron Works, Oakland, Calif.; G. H. Alten, Alten's Foundry & Machine Works, Lancaster, O.

(Fourth row, left to right): J. B. Heisler, A. C. Williams Co., Ravenna, O.; C. B. Shanley, Semi-Steel Castings Co., St. Louis; Sheldon P. Pufahl, Pufahl Foundry Inc., Minneapolis; C. R. McGrail, Texaloy Foundry Co., San Antonio, Tex.; J. O. Jackson, Jackson Industries Inc., Birmingham.

inferior quality of blast furnace coke which tends to reduce production; the scarcity of scrap; heavy consumption of pig iron in the manufacture of cast iron ingot molds; and, of course, the high rate of steelmaking and foundry operations.

Imported pig iron has been of little assistance in relieving the domestic shortage, receipts of foreign iron the first seven months this year totaling only 16,000 tons. Incidentally, exports during the same period were only 7000 tons, mostly to Canada.

Foundry coke production so far this year has been at an all-time high, it was stated by Samuel Weiss, executive secretary, American Coke & Coal Chemicals Institute, Washington. If the recent rate is continued, 1947 output will total about 3,809,000 tons, compared with the former peak of 3,861,000 tons in 1918. Quality of coke has slipped, according to Mr. Weiss, and while some improvement may be expected as additional coal cleaning facilities are provided, it is unlikely we shall ever get back to the quality available prior to 1935. The reason is that we have skimmed the cream from the supply of good coking coal, and today's coke reflects the poorer quality of coal available to oven operators.

Tight Squeeze—The scrap industry hopes to get through the winter without any shutdowns of steel mills or foundries but it is going to be a tight squeeze, according to Edwin C. Barringer, executive secretary, Institute of Scrap Iron & Steel Inc., Washington, who discussed the cast scrap outlook. He pointed out that the supply of cast iron scrap for foundry cupolas is particularly dependent upon the factor of obsolescence, and this factor is accentuated when new products appear on the market. This means that the cast scrap potentially available from automobile graveyards, farms and railroads will not move to market until a sufficient volume of new automobiles, agricultural implements and rolling stock is provided.

Other speakers at the meeting included John Lovett, general manager, Michigan Manufacturers' Association, Detroit; Herbert L. Tigges, vice president and sales manager, Baker Bros. Inc., Toledo, O.; B. A. Krawczyk, supervisor, compensation department, Allis-Chalmers Mfg. Co., Milwaukee; and Dr. Alfred P. Haake, Chicago economist.

The next annual meeting of the Gray Iron Founders' Society will be held at Haddon Hall, Atlantic City, Oct. 14-15, 1948.

New Steel Production Facilities Announced; Oxygen Plants Planned

FURTHER details of the steel industry's expansion program, designed to make 2½ million more tons of steel in critically needed forms available to the metalworking industries by the end of 1948, are being revealed. Facilities just announced will increase capacity for making pig iron, coke, steel ingots and finished products.

At the same time, C. M. White, president of Republic Steel Corp., explained to members of the American Gas Association meeting in Cleveland, why an expansion of 10 million tons, as has been suggested in some quarters, is not feasible at this time. Such a program, he pointed out, would divert a million and a half tons of steel immediately from consuming industries. Because of abnormal construction costs at present, steel produced in such new facilities would have to be priced at least $20 a ton higher than at present.

Mr. White said that despite present high costs, his company has made commitments since V-J Day for $108,550,000 for expansions and improvements and that the company is producing 17 per cent more tonnage than it was capable of in 1939.

E. T. Weir, chairman, National Steel Corp., stated his company has under way a $100 million program which will increase capacity 20 per cent, or 800,000 tons annually. About 300,000 tons will result from additional plant and facilities at Great Lakes Steel Corp. in Detroit and nearly 500,000 tons will result from the installation of an oxygen plant at the Weirton Steel Co., Weirton, W. Va.

The oxygen plant will cost $4 million and will be capable of producing 400 tons of oxygen (93 to 95 per cent pure) daily at costs substantially below those at present. Plant will be constructed by Air Products Inc., Emmaus, Pa. A second oxygen plant will be built at Great Lakes.

Ford Motor Co. announced construction of a third blast furnace and other facilities at Dearborn (see page 69) in an $18 million program. Bethlehem Pacific Coast Steel Corp.'s new 50-ton electric furnace, largest on the West Coast, is nearing completion and will virtually double that plant's steel producing capacity. Bethlehem Pacific also is installing a new 32-in. blooming mill, a new wire mill, a high-speed bar and rod mill. Total program is placed at $15.5 million.

Sharon Steel Corp. has placed in operation a new 30-ton electric furnace, doubling capacity at Lowellville, O., plant, being converted to production of special steels. Sharon has purchased the Carpentertown Coal & Coke Co. in western Pennsylvania, consisting of a coal mine and 300 beehive coke ovens, to give company a better coke supply.

Allegheny Ludlum Steel Corp. has purchased the government-constructed Brigham Road bullet core steel plant in Dunkirk, N. Y., for $1.5 million and will spend $500,000 in converting plant for production of stainless.

Missouri-Illinois Furnaces Inc., organized jointly Oct. 3 by Koppers Co. Inc., Pittsburgh, and Hanna Coal & Ore Corp., Cleveland, has submitted high bid of $3,255,000 for the government-owned blast furnace at Granite City, Ill. Koppers Co., which has been operating the plant under government subsidy, will continue to operate the plant and will continue to serve some 75 foundries and 5 steel plants in the St. Louis area.

National Tube Co., United States Steel Corp. subsidiary, pushed the first coke from its new plant at Lorain, O., Oct. 9. Plant is composed of three batteries of 59 ovens each with a total rated annual capacity of 800,000 net tons, raising the plant's total capacity to 1,650,000 tons.

Other projects under way at Lorain include a new continuous seamless mill, a blooming, bar and billet mill, a new bessemer steel plant and a 3-acre warehouse.

American Rolling Mill Co. has fired a new battery of 25 by-product ovens at Hamilton, O.

PAT ON BACK

While various groups lambaste the steel industry for inadequate production capacity, Alfred P. Sloan Jr., chairman, General Motors Corp., one of the nation's largest consumers of steel, declares the steel industry has done its best to satisfy the current extraordinary demand for its products.

Furthermore, Mr. Sloan's opinion is that present steelmaking capacity is sufficient for future needs.

Ordnance Group Says New Lines Aid Tool Firms

Expanded line of products discussed as depression-buffer at Army Ordnance Association meeting

ACTIONS taken by machine tool builders to minimize the effects of severe cyclical depressions which in the past have threatened the existence of all durable goods producers were summarized by members of the Army Ordnance Association during the technical sessions held by that group in the Waldorf Astoria, New York, recently.

The new policies which are being adopted by increasing numbers of tool builders represent a sharp divergence from the former generally universal practice of "putting all their eggs in one basket." A product development program consisting of three phases is now being used by a number of member companies of the association, the discussions revealed.

Diversified Manufacture — These three phases which relate to entirely separate types of products are: Original prewar lines of manufacture, brought up-to-date with the latest refinements in machine tool design; completely new products from the machine tool builders' standpoint —these products reaching new markets and consequently having different peak seasons and declines; and government requirements of ordnance and other special equipment, having no industrial counterpart.

Individual company efforts to minimize reliance on a continued large machine tool demand for their corporate health were explained by representatives of many tool building firms which have expanded operations into other products related only distantly to machine tools. The Special Products Division of Lodge & Shipley Machine Tool Co., Cincinnati, is making small transmissions for garden tractors and stokers, and a low-horsepower motor unit for attachment to lawn mowers, etc. Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., is producing not only perishable tools but also plastic injection molding machinery. Warner & Swasey Co., Cleveland, is another outstanding example of companies which have gone into markets entirely apart from those normally open to machine tool producers in an attempt to broaden the range of prospects and thus provide a buffer against slack tool buying periods.

BEARINGS BOOM

New peacetime markets boosted sales of ball and roller bearings to an average of more than $20 million a month during the first nine months of 1947, George Carleton, president, Anti-Friction Bearing Manufacturers Association, reports.

This represents a 250 per cent increase in annual gross dollar sales volume above the industry's prewar year of 1937. The all-time high in dollar volume was reached during the war when $30 million in bearings were shipped monthly during 1944.

"Ball and roller bearings are being installed in increasing numbers in farm machinery, machine tools, textile equipment, railway cars, household appliances and automobiles," Mr. Carleton said. Chief users, he added, were the automotive, agricultural implement, machine tool and railroad industries.

Tool Ordering Drops To Postwar Low in August

Buyers of machine tools in August, anticipating the recently held Machine Tool Show, placed orders for the smallest dollar volume of new tools that had been received by members of the National Machine Tool Builders' Association since the war's end. Dollar volume of ordering was 28 per cent below that for the previous month, but, according to the trade, the drop marked a temporary hold-up on buying until the industry's latest models could be seen in operation at the show.

Shipments of new tools during the month were valued at $18,520,000, only slightly below the $18,924,000 worth which were shipped in July. Although sustained shipments and lower volume of orders reduced the industry's order backlog, the cut was tempered somewhat by a decline of 22 per cent in order cancellations.

New foreign orders, despite the growing dollar shortage, accounted for more than one-fifth of all orders placed.

Manufacturers Foresee Brighter Building Outlook

Greater cost stability, better supply of materials and higher labor productivity cited by Producers' Council

AN ENCOURAGING note on the building situation was sounded at the 26th annual meeting of the Producers' Council Inc., a national organization of manufacturers of building products and equipment, in New York recently.

David S. Miller, newly elected president, said that building volume is on the upgrade; that costs are stabilizing and materials shortages are disappearing. He also declared that productivity of labor is improving, building time is being shortened and the quality of new building is getting back to normal.

Mr. Miller, who is sales promotion manager, Building Materials Division, Armstrong Cork Co., Lancaster, Pa., succeeds in his new position as president of the organization Tyler S. Rogers, assistant to vice president, Owens-Corning Fiberglas Corp., Toledo, O.

Other new officers of the council are: F. L. Riggin Jr., Mueller Brass Co., Port Huron, Mich., first vice president; C. R. Raquet, Detroit Steel Products Co., Detroit, second vice president; C. A. Snyder, Richmond Screw Anchor Co., Brooklyn, secretary; and W. B. Peters, Truscon Steel Co., Youngstown, O., treasurer.

Materials on Display—A feature of the convention was an exhibit by 55 manufacturers of building materials and equipment. Latest developments in modular co-ordination with particular emphasis on its relation to the industry-engineered housing program were demonstrated.

Maj. Gen. Philip B. Fleming, federal works administrator, predicted that public building expenditures for the coming year will reach $3.7 billion, or nearly 30 per cent more than was estimated for the current year. The bulk of this increase, he said, will come from state and local construction rather than federally financed work.

General Fleming predicted that road work will be larger in 1948, amounting possibly to $1.5 billion as against approximately $1.1 billion this year. This program will be double the amount spent on roads in 1946.

Company Praises Pay Plan Geared To Cost of Living

Michigan Tank & Furnace Corp. finds sliding scale promotes good labor relations. Profit-sharing system lauded

PROBLEM of keeping employees' wages in line with the cost of living, particularly important factor in maintaining good labor relations when living costs are rising, is being effectively dealt with by a Michigan metalworking company.

The Michigan Tank & Furnace Corp., 14247 Tireman Ave., Dearborn, Mich., uses for all production employees a sliding wage scale system geared to the cost of living index compiled by the U. S. Bureau of Labor Statistics. If the bureau's index rises one point, every production worker receives a one-cent hourly increase in pay. Conversely, the hourly rate is adjusted downward one cent an hour per point of decrease in the labor bureau's index on the cost of living.

Promotes Friendly Spirit — Inaugurated in March, 1946, the system, says the company, removes the immense burden of worries and problems confronting the production employee as a result of rising costs of living and assures increased co-operation and friendliness toward his fellow-worker.

Also instituted in 1946 was a profit-sharing plan as an incentive and a faithful service reward for production employees. This program, the company reports, resulted in increased production by the employees and increased profits for the year ended June 30, 1947. As a result, the production employees received bonuses for the year ranging from $377 to $628 each, depending on the number of years of continuous employment.

Changes Ruling Concerning Affidavits on Communism

Agreement by Robert Denham, general counsel of the National Labor Relations Board, to abide with the NLRB ruling that top AFL and CIO officials do not have to disavow communist ties before local unions can gain access to the board's jurisdiction is expected to bring the board back into wide usage in settling labor disputes.

Top officers of the AFL and CIO had opposed Mr. Denham's interpretation of the Taft-Hartley Act that communism be disclaimed by them before any local unions could utilize aid of the NLRB. The NLRB had held that a local union can qualify to do business with the board if its own officers sign the loyalty pledges, regardless of the stand taken by any federation with which the union is affiliated. The AFL and CIO are federations of many unions. Numerous unions had indicated they wished to qualify to use the facilities of the NLRB.

Although Mr. Denham, as general counsel, had final authority under the law to insist on his own opinion and could have thrown out cases, he agreed to abide with the board's ruling that local unions by disavowing communism could avail themselves of NLRB assistance even though top AFL or CIO officials had not disclaimed communism. Mr. Denham said he decided to go along with the board's ruling as a matter of good administrative strategy. He added that the board could not operate effectively if it took one course and he another.

Sen. Robert A. Taft (Rep., O.), co-author of the Taft-Hartley Act, commented: "The decision of the board is certainly not in conflict with the intention of Congress. I assume that the board's ruling will lead to general acceptance of this provision of the law."

MAN WITH PLAN

Efforts to obtain write-off of a third of $100 million loan from the Reconstruction Finance Corp. will be abandoned by Henry J. Kaiser, West Coast industrialist, provided the full loan is changed from a first to a second lien so he can float a bond issue in private quarters for doubling capacity of his Fontana, Calif., steel plant.

His proposal, laid before President Truman, would enable the Fontana plant to expand annual output to 600,000 tons of sheet steel.

Mr. Kaiser indicated his desire to sell $80 million to $100 million of bonds with a first mortgage on the plant, the money derived from the bond sale to be used in expanding the plant's capacity.

West's Industrial Growth Directs Attention to Coal

Feasibility of using low-grade western deposits studied as reserves of petroleum and natural gas dwindle

SAN FRANCISCO

EXPANSION of steelmaking facilities in the West to help fill the demands from metalworking plants is putting new emphasis on western sources of coal as underground reserves of petroleum and natural gas dwindle.

Most of the West's usable supply of coal is obtained from Utah, Wyoming and Oklahoma, but recently California's deposits of low-grade coal have received new attention.

Low-grade Coal Available — In a special report, the California Chamber of Commerce points out that experiments in the use of low-grade coal in liquid or gas form, to supplement petroleum or natural gas, have focused attention to the little-known fact that 43 counties in California contain deposits of coal, all of it low-grade.

The U. S. Geological Survey estimates California has a total workable coal area of 500 sq mi extending along the coastal range and spotted in the Sierra Nevada foothills. Original content of these fields was estimated at a billion tons.

Poor quality and high transportation costs from isolated areas have worked against development of California coal deposits. None of the coal has been suitable for steelmaking.

Leases Coal Land — As part of the effort to build up stable sources of coal, Kaiser Co. has just acquired a 20-year lease on 2520 acres of government coal land in Emery county, Utah.

Argue Over Taxes—Utah figures in the news from another angle. The office of Utah's attorney general is opposing the United States Steel Corp.'s contention that its purchase of the Geneva steel plant from the War Assets Administration was not subject to the Utah sales tax. Opinion of Assistant Attorney General C. L. Rampton is that about $15 million of the $40 million purchase price was for tangible personal property and therefore subject to Utah's sales tax and use tax. Levy on the transaction would amount to $300,000.

Windows of Washington

By E. C. KREUTZBERG — *Washington Editor, STEEL*

New government labor conciliation policy reflected. Eighteen per cent of cases dropped without action because of intrastate nature, local mediation was available or because cases were not admissible under Taft-Hartley Act

PARTIAL statistics now available show that the government has made a good start in carrying out the wishes of Congress, as set forth in the Taft-Hartley Act, in regard to government intervention in labor disputes.

Of 1000 dispute cases assigned to conciliators during the period July 24 through Sept. 17, 18 per cent were dropped without any action whatever for one of these reasons: Because the cases involved intrastate rather than interstate commerce, because state or local conciliation services were available, or because they were grievance cases of the types not admissible under the new law.

This compares with the record of the old United States Conciliation Service of never dropping a single case.

The record set forth above is regarded as only a beginning. Under the "hard-to-get" policy decreed by Cyrus S. Ching, director of the new Federal Mediation & Conciliation Service, a growing percentage of the cases is being dropped.

The service currently is assigning 200 to 250 cases a week to its conciliators, based on dispute notices or complaints from one of the parties in dispute. It is much too early to gather statistics on the disposition of these cases but, based on policy instructions, the great majority will be washed out because of unwillingness of the service to intervene or—and this is expected to be the really big factor—because the parties have been able to settle their disputes without intervention.

Plan Steel Industry Study

A meeting of Commerce Department officials with the Committee on Commercial Research of the American Iron & Steel Institute will be held shortly to advance plans for early publication of the Commerce Department's projected book on the iron and steel industry. This is the book in which the department plans to assemble for the first time between two covers "all existing information about the iron and steel industry."

Six of the planned 18 chapters already have been submitted to the Committee on Commercial Research in multigraphed form for correction, and others will go out over the next week or two.

Current expectations are that the book will come from the Government Printing Office well before the end of the fiscal year ending next June 30.

The author, R. M. Weidenhammer, recently returned from a 10-day trip as a government delegate to the iron and steel meeting of the International Labor Office at Stockholm to find he had been removed from the Commerce Department payroll as a result of a Civil Service ruling that temporary war service employees must be replaced by career employees when the latter are in a status of unemployment. Department officials were able to get Mr. Weidenhammer off the hook until Jan. 1, and will intercede for him again on that date in order that he may stay long enough to finish the iron and steel book.

Seek Government Efficiency

The 12-man commission headed by former President Herbert Hoover will hold its first "work" meeting Oct. 20 at its offices at 1626 K. St. N.W. Established by a resolution introduced in the House by Rep. Clarence J. Brown (Rep., O.) and sponsored in the Senate by Sen. Henry Cabot Lodge Jr. (Rep., Mass.), its job is to find ways and means for making the executive branch of the government function more quickly, smoothly and at less expense to the taxpayers. It has an appropriation of $750,000 for maintaining a staff and meeting other expenses, including the retention of consultants and advisers from the ranks of private citizens on a per diem basis of $50 per day and expenses.

When the commission, in meeting for purposes of organization on Sept. 29, called at the White House, it was warmly received by President Truman who remarked on the difficulties incident to running 10 executive departments and 40 independent offices. The Hoover commission is strictly nonpolitical and, so that its findings can not figure as issues in the 1948 elections, it will not report until the first quarter of 1949.

JUST GOSSIP

If Congress is called into extra session many committee chairmen plan to use the time for other matters than the President's emergency program, according to advance indications. As viewed at this stage, the emergency program will occupy the full attention of only the foreign affairs and appropriations groups. This will require at least a month, it is believed, and in this time, legislators not immediately involved in the President's plan are likely to get busy on other legislation.

Drop Government Periodicals

As a result of House Appropriations Committee criticisms in reporting its appropriation bill for fiscal 1948, the Commerce Department is studying ways and means of improving its services and giving the taxpayers more value for their money.

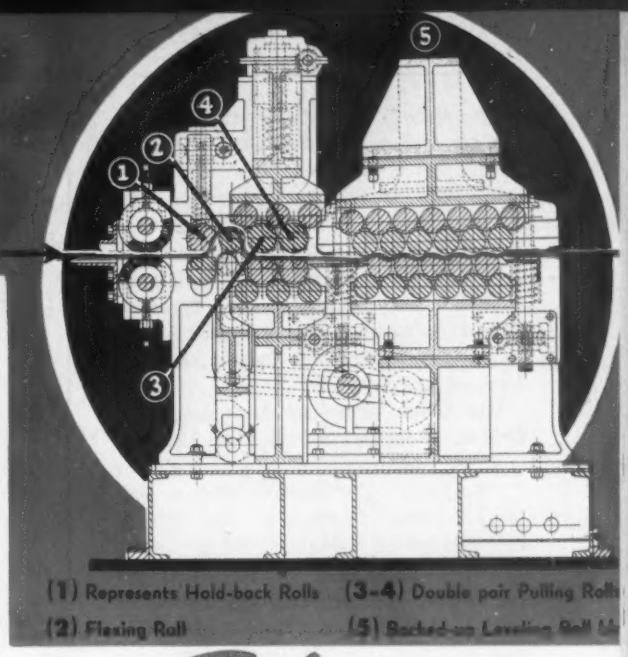
Currently Commerce officials are reviewing the department's publishing policy. Most important action is a decision to discontinue *Domestic Commerce Monthly;* it went out of existence with the September issue. It thus follows the department's *Federal Science Progress* which was discontinued last spring. On the other hand, it was decided that *Foreign Commerce Weekly* and the *Survey of Current Business* serve a real purpose in advising business and industry and should be continued. The current attitude also favors continuance of the service known as Industrial Reference Service Reports.

But prices on these publications probably will be increased so as to cover all costs. It is expected that the prices charged by the Office of Technical Services for reports on technological developments in Germany during the war will be increased substantially.

Atomic Energy Information

In accordance with the administration view that information on atomic

BUDD-McKAY



IN operation, a sheet is fed between the brush rolls, the hold-back rolls and into the bite of the pulling rolls which draw it into the machine. After the sheet is securely gripped by the pulling rolls, the flexing roll is automatically shifted from its idle position below the pass line into its upper, or working, position as indicated by (2). This causes the sheet to go into a full quarter turn around the exit side of the hold-back rolls (1), a reverse half-turn upward over the flexing roll (2), and another reverse quarter turn downward around the first top pulling roll (3).

The triple bending, or flexing, of the sheet as it passes in and out of the loop kneads the steel and imparts the desired amount of cold plasticity. A second set of pulling rolls (4) directs the sheet into the backed-up leveling rolls where it is flexed repeatedly and finally ejected a flat sheet.

The progressive advancement of the bend throughout the area of the sheet, followed by a pass through the staggered leveler rolls, permits the flexing to be carried much further beyond the elastic limit of the steel than is possible by any roller leveler, thus affording greater freedom from stretcher strains.

While conventional four-high roller leveling machines assist fabricators in securing a suitable texture in steel sheets, yet the mechanical work accomplished is not sufficient to make the sheet altogether immune from surface blemishes. The flexing action of the BUDD-McKAY PROCESSOR frees the grain structure so that, when the steel is drawn under dies to the desired contour, stretcher strains do not occur.

Sheets processed by the BUDD-McKAY PROCESSOR remain free from strains longer because of the extreme flexing and thorough roller leveling, but subsequent forming operations should follow soon after the processing if its full benefits are to be obtained, as a lapse of time causes the sheet to display a tendency to return to its initial condition.

Sheet PROCESSING MACHINE

WITH THE NEW BUDD-McKAY SHEET PROCESSING MACHINE it is possible to render sheets free of stretcher strains. Sheets processed on this patented processing machine have far superior stamping and drawing qualities, and retain these qualities much longer, than sheets processed by any other method.

BUDD-McKAY (PATENTED) PROCESSOR

The **McKAY MACHINE** *Company*

ENGINEERS AND MANUFACTURERS OF SHEET, TIN, AND STRIP MILL EQUIPMENT

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developments should be passed on to the American public in largest possible measure, without, however, loosening up on military secrets, the Atomic Energy Commission has reorganized its public relations work. It has appointed as its director of public and technical information Morse Salisbury, former director of information for the Department of Agriculture.

His three principal assistants are former members of the Manhattan District information staff—Edward R. Trapnell, Dr. Harold Fidler and Dr. Alberto Thompson. Dr. Fidler has charge of declassification policy, and Dr. Thompson of technical information. To prevent disclosure of secret information, the commission has a consulting staff of more than 100 scientists and engineers who serve as reviewers.

All requests for permission to publish information on atomic energy should be addressed to Dr. Fidler, Atomic Energy Commission, Washington 25, D. C.

LOYALTY TESTS: Federal employees in agencies throughout the country are being subjected to investigations of their loyalty to the United States. Above, postoffice employees in New York are fingerprinted as part of the loyalty program. NEA photo

Excise Tax Study Completed

The Treasury Department has completed a study of current excise taxes. It is one of a series bearing on proposals for postwar tax revision. This report, dealing with the present taxes on retail sales of furs, jewelry, luggage and toilet preparations, analyzes the economic background of the industries concerned, the effect of the tax on profits, on business costs and competition, and on consumers, and technical and administrative problems which the taxes involve. Like all similar reports, this one does not make policy recommendations.

Interested businessmen can get copies of the report, identified as No. S-482, and entitled "Federal Retail Excise Taxes," by writing the Treasury Department's Press Service, Washington 25, D. C.

Rural Electrical Market

While the Rural Electrification Administration has not had a hand in setting up any big programs of late, it continues to put out money which has the effect of enlarging the rural market for electrical farm and household equipment. Its latest loan authorizations come to a total of $1,781,000, the largest part to be spent in stringing 677 miles of distribution lines to serve 2098 farms and other rural establishments.

The loans are as follows: $595,000 to C & L Rural Electric Co-operative Corp., Star City, Ark.; $483,000 to Ozark Electric Co-operative, Mt. Vernon, Mo.; $353,000 to Tri-County Electric Co-operative Association, Lancaster, Mo.; and $350,000 to Lamar County Electric Co-operative Association, Paris, Tex.

Building in Panama

A $6 million construction program has been launched by the Army in Panama, in addition to earlier projects totaling $2 million, according to a report to the Department of Commerce. The larger schedule includes additional living quarters at various permanent posts in the Canal Zone, warehouses, and other construction.

Explains "Firm Orders"

Recently the Office of International Trade announced export licenses may be used to export only the commodities named therein pursuant to firm orders which the licensee had received on or before the validation date of the license. In view of the many inquiries as to the meaning of the term "firm order," the OIT has issued the following interpretation:

The term "firm order" as used in the export regulations is interpreted to mean an order placed with an exporter in the United States by an importer in a foreign country which, if accepted by the exporter, will result in a binding contract between the exporter and the importer. While the terms of the order may be conditioned, such terms must be ascertainable and certain; for example, (1) the terms of payment may provide a price dependent upon the market price at the time of delivery; (2) the time or place of delivery may be dependent upon an event in the future, etc. In other words, a "firm order" is more than a mere business inquiry relating to the possible purchase of merchandise, although it need not be an agreement which can be presently executed. Furthermore, while orders may be conditioned upon the issuance to the exporter of an export license by the Office of International Trade or the issuance to the importer of an import permit by his government, such orders would still be considered as "firm orders" within the meaning of these provisions.

Would Peg Truck Loadings

Truck loadings should be pegged at 18,000 pounds per axle, with a 10 per cent tolerance, until such time as the standard of highways throughout the United States has been sufficiently elevated, in the opinion of Charles M. Upham, engineer-director, American Road Builders' Association, Washington. He gives this as an answer to the controversial question: "Shall we build vehicles to suit the highways or highways to suit the vehicle?"

"Future sizes and weights of motor vehicles will depend on highway design, and highway design must be kept within the limit of public expenditure and public opinion. In the meantime, the suggested loading of 18,000 pounds per axle should give a generous limit within which truck designers can use their ingenuity in providing for maximum pay loads." Eventually this figure should be increased, says Mr. Upham.

Europe's Needs Still Undetermined

Demands on American economy for steel and durable goods subject to intensive study with Marshall Plan still in sketchy stage

ASIDE from the knowledge that Europe will need huge quantities of food and coal—all that the United States can possibly spare—to tide it over the coming winter, Washington's information about what is needed to carry out the so-called Marshall Plan is sketchy. Hence the President's Committee on Foreign Aid has been forced to postpone from Oct. 1 to Nov. 1 the deadline for drawing up a complete plan for what is to be shipped to Europe.

To get a better line on what actually is needed, the committe has invited a number of American engineers now in Europe, and thoroughly familiar with the European economy, to come here by air and sit with its Durable & Capital Goods Subcommittee, headed by H. G. Batcheller. Also, a number of participants in the Paris conference which drew up the report of the needs of the 16 nations who have enrolled to co-operate in carrying out the Marshall Plan have been asked to come to Washington with more exact information.

Decisions Held Up—In the meantime, until this further information is at hand, all decisions as to what goods are to be allocated to Europe will be held up. This also applies to the Office of International Trade which has decided to delay fixing fourth quarter steel export allocations until such time as they can be tied in with the aid-to-Europe program.

In a general way, the Harriman Committee on Foreign Aid has arrived at the decision that aid to Europe must not involve quantities of scarce goods in amounts that would cripple our economy or cause real suffering at home. This is true of food, coal and all other goods. The question in each case, says a committee spokesman, will be: What is the relative urgency of American needs as compared with European needs?

Exports Declining—As to steel and capital goods made from steel, this spokesman told STEEL, the value of shipments we will send forward to Europe will probably be much less than some published prognostications have indicated. "On the basis of all factors which it has been possible to consider up to this time," said this spokesman, "the movement, including everything, should not be sufficient to arrest the declining trend in our exports. Our exports to Europe during the fourth quarter of this year and the first quarter of 1948 should be $1 to $2 billion less than during the first half of 1947."

The aid program, it is pointed out, envisions an outlay of around $22 billion over 1948, 1949, 1950 and 1951. Of this total the immediate or "stop-gap" needs are most important. The needs for fiscal 1948 are set at around $6 billion. Of the shipments during fiscal 1948, it now is believed, the overwhelming valuation will be represented by food and coal.

Stop-Gap Steel Needs—That there will be a need for considerable steel during this stop-gap period now is believed a reasonable assumption. But whether the Harriman committee will be willing to recommend much more tonnage than would be involved in the regular OIT fourth quarter allocations remains to be seen. Certainly some requests have raised questions and they will have to be bolstered by additional information to show real need. For example, The United Kingdom wants to import billets, blooms, slabs and sheet bars from the United States and deliver the finished rolled products to other European countries, particularly plates for building ships in the Scandinavian countries. If urgent need is proved, the committee probably would recommend shipping finished plates, sheets, etc., rather than the semifinished steel, thus retaining here the scrap incidental to the manufacture of the finished products.

The Harriman committee wants more information on capital goods needs. The report of the Paris conferees specifically mentioned needs under these classifications: Coal mining machinery, agricultural machinery, petroleum refining equipment, electrical generating machinery, and transportation equipment. The report made passing references to the filling of some of these needs, at least, by European manufacturers. The various countries would unite with France in a customs union to eliminate the need for paying the customary import duties on these badly needed goods. However, the report did not indicate just where these respective needs fit into the overall 4-year program. What the Harriman committee wants to know is: What are the immediate European needs for the various items of capital equipment? The committee's feeling is that the best good will be served by helping Europe's manufacturing plants back into production, and that immediate American help should go no further than that.

Huge Sum Involved—At the same time, the Harriman committee will not seek to discount any of the European figures. It takes for granted that the complete program calls for around $22 billion, of which the United States will be asked to finance around $19 billion. Any attempt to shrink the European program, the committee feels, might prove to have dangerous consequences at a later date.

The LaFollette subcommittee continues to work on the perplexing problem of assigning the various tasks involved in the aid program. One of the plans being studied, which would require congressional action, would establish a "European Reconstruction Corp." This corporation would attend to all the business details. The subcommittee now is trying to visualize a special policy-making body which would continuously screen European requirements and instruct the European Reconstruction Corp. as to what to buy and where to ship it, and when. The subcommittee also is wrestling with the problem of what sort of a financing arrangement it should recommend to Congress at such time as Congress goes into the matter.

Surprising Feature—A rather surprising feature of the report of the Paris conference was the low estimate of the value of goods which the 16 European nations expect to export to the United States during the 4-year period 1948-1951. According to the report, these nations expect to be able to sell goods here during that period in the value of $2,810,000,000.

Part of U.S. Share in Jap Fleet To Be Sold as Scrap

Department of the Army has announced that materials resulting from the partial scrapping of the U. S. share of the former Japanese fleet will be offered for sale in Japan. Purchasers of such scrap will be required to return it to the United States.

Europe Expects To Erase Steel Deficit by 1951

Marshall Plan participants say output of 55.4 million tons is possible. Germany holds key to coke shortage

PARIS, FRANCE

EUROPEAN self-sufficiency in most steel products can be expected some time during the 1948-1951 period and the present deficit of coke can also be made up to a large extent by that time, the sixteen nations comprising the Committee of European Economic Co-operation have determined.

Meeting to assess their shortages and outlook under the Marshall Plan, the members regarded this first examination of steel output on an international scale as extremely productive and plan to hold regular meetings in the future.

Aim at Higher Production—Ingot steel production by the members and western Germany is expected to be boosted to 55,400,000 tons by 1951, and finished steel output of 43,900,000 tons is hoped for by that time. These goals are considerably higher than the aggregate production of the member states in their best respective prewar years; highest prewar finished steel output of the members, for example, was only 40 million tons. Of the total output by 1951, 11 per cent will be exported, a figure comparable with prewar export activities of the co-operating nations.

Metallurgical coke supply, as determined by the steel subcommittee of the committee, will show a deficit of 13 million tons in 1948, 66 million tons being required against 53 million available. Germany is seen as the only country capable of increasing its coke production, and, if encouraged, two zones of Germany could increase their output by at least 10 million tons.

Use of Power Curtailed—In France industrial production recently has been hampered by a severe drought which has reduced the amount of hydroelectric power available. To conserve electricity, a distress plan has been instituted by the government, closing factories for two consecutive days each week and shutting off electricity to the cities for several days weekly. This plan is more drastic than that applied last year and has been put into effect earlier than was thought necessary in 1946.

Delays in delivery of all kinds of finished steel are increasing, deliveries of sheets now ordered being 18 months away. Export quotas of French steel products have also been increased.

Prices Rise Further—Steel prices are expected to be increased about 5 per cent in the near future to meet higher coke prices and increased freight and wage costs.

Measures to restore the value of the franc are soon to be put into effect, according to Robert Schuman, minister of finance, who says they will be promulgated by decree without a vote by the National Assembly. Aim of the program, in addition to stopping inflation and lowering prices, is to restore French credit by balancing the government's budget.

RUSSIAN TRACTORS: Power to harvest the largest grain crop in many years is what the Russians say about this picture, showing tractors being loaded for shipment from the Dzerzhinsky works in Stalingrad. NEA photo from Russian sources

Belgian Engineering Group's Centennial Stresses New Metallurgical Developments

LIEGE, BELGIUM

CELEBRATION of the 100th anniversary of the founding of the Association of Engineers of the University of Liege marked an important milestone in Belgium's industrial development. The centennial celebration, featured by speeches by many of Europe's most prominent leaders, consisted of two parts: An exhibition of the newest instruments for scientific research and quality control, assembled from all parts of the world; and an industrial congress at which approximately 550 papers were presented.

Theme of the congress—"The Past, Present and Future of Belgian Industry"—placed emphasis upon the new techniques which must be universally adopted if Belgium is to show progress in the future consistent with the progress it has shown in the past.

Sessions of the meeting were divided into 14 sections. Coal mining, discussed under the general mining section, was of particular interest to the industrialists and engineers in attendance because of the current lack of fuel. A section on geology had as its object inventorying the mineral wealth of the country and of the Belgian Congo.

Progress in Metallurgy—The section on metallurgy was divided into four subsections: Physical metallurgy subsection dealt with modern methods of metal analysis, study of metal surfaces and their protection, elec-

trolytic polishing and powder metallurgy; iron and steel metallurgy subsection covered general technical problems, modern methods of control and probable future developments; foundry subsection investigated steel castings, high duty and alloy cast irons, scientific control and other special subjects; the nonferrous subsection covered metallurgy of zinc, lead and aluminum and modern methods of measuring hardness of these metals.

The exhibition which began in early August and continued through the greater part of September was composed of 20 operating laboratories, showing the latest control and research apparatus. A large part of the show was devoted to displays of instruments from Belgian, American, British, French, Dutch, Swedish and Swiss manufacturers. In the metallurgical laboratories displays of machinery for chemical and physical testing, metallography and heat treatment were in operation.

A number of the instruments shown will be placed in operation in the university's laboratories, but it is contemplated that a permanent exhibit of industrial equipment will be established to keep the engineering profession in Belgium abreast of the latest world-wide developments.

Large Demand for Copper Products Reported in Cuba

Cuban industry is looking to the United States for the largest part of its supply of copper products, according to a report by the Department of Commerce. Although Cuba is a producer of copper ore, its processing is limited to concentrating, and the bulk of its output is shipped to the United States.

Requirements of Cuban copper consumers, which include the sugar mills, using pipe and tubing, wire plates, sheets and strip, the electric power generating companies, the government-owned telegraph system and the telephone and street railway companies, will reach unprecedented high levels in the next few years, the department said, citing the lack of adequate imports during the war years as contributing to a backlog of demand which will take several years to satisfy.

Sugar mills are estimated as requiring in 1947 three times the amount of pipe and tubes which was imported annually in the period 1935-39. Combined demand of all industries for copper wire and cable is at least four times as great now as imports were in 1944.

Reduction in Iron, Steel Prices Promised by Belgian Producers

Export trade continues lively, but dollar shortage threatens. European pig iron and steel production generally shows upward trend despite shortage of scrap, fuel and labor. Nationalization of British steel industry urged by Trades Union Council

LOWER prices on iron and steel products have been promised by Belgian producers in answer to the government's request to all industry to reduce prices. Amount of the decrease has been agreed upon at $2.27 per ton.

In the export market Belgian steelmakers have been pricing their steel at levels above those quoted by foreign competitors, but are in the advantageous position of being able to offer relatively short delivery. Recently steel bars for Greece and Turkey have been quoted at $160 per ton cif; the price to Swedish buyers is $94 fob for the same product; hot rolled hoops for South American customers have been priced at $208.70.

Some difficulty is being experienced in financial aspects of export transactions, with a credit sterling balance being built up while trade with dollar nations is resulting in a dollar deficit. The situation has approached the point where either imports of dollar-based materials must be reduced or exports to dollar markets must be increased.

Exports by Belgium and Luxemburg are holding at high levels, August shipments of 220,120 tons having been exceeded this year only by those of June. Industrial production during August generally was satisfactory, although it showed a normal seasonal decline. Output of pig iron was 220,550 tons against 235,270 in July; steel ingot production dropped to 222,400 tons from 235,760 tons.

Austria

Iron and steel production in Austria is improving. Output of pig iron in July jumped to 33,600 metric tons and is expected to reach 40,000 tons soon. Output of steel ingots and castings reached 36,500 tons in that month, but a shortage of scrap is preventing higher rate of operation.

Czechoslovakia

Supply of scrap in Czechoslovakia is hindering operations, although the rate is fairly well maintained, August production of pig iron being 120,397 tons against 120,480 tons in July and of steel ingots of 179,369 tons against 166,782 tons in July. Output of rolled products increased in August to 122,017 tons from the July figure of 115,721 tons.

Germany

July output of steel ingots and castings in the British zone of Germany was 237,000 tons compared with 204,209 tons in June. Pig iron production was also up, at 154,368 tons compared with 133,315 tons; rolled steel, too, showed an increase, 171,320 tons having been produced against June output of 166,235 tons.

Italy

Iron and steel production in Italy is on the upgrade, although the trend is very gradual. Heavy home demand is stimulating output, which is severely hampered by the continuing fuel shortage. For the year's first seven months total production of pig iron and steel ingots was estimated at 300,000 metric tons and 950,000 tons, respectively.

Scandinavia

Swedish iron and steelworks, handicapped by a shortage of labor, turned out 383,000 tons of pig iron, 614,700 tons of steel ingots and 422,800 tons of rolled and forged products in the first six months of this year, compared to 359,100 tons, 625,400 tons and 439,100 tons, respectively, in the first six months of 1946.

Great Britain

Government assurances that a scheme for the nationalization of the iron and steel industry was being drafted were accepted by delegates of the Trades Union Council, and that group agreed not to press for such legislation during the next session of parliament. This easing in pressure for immediate nationalization will allow the industry some additional time to prepare its arguments against government operation.

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NO OTHER SHAFT-TURNING LATHE OFFERS ALL THESE ADVANTAGES

Hydraulic, centering-type chucks on all 3 spindles . . . each chuck operated by individual foot-treadle, freeing operator's hands . . . saddle and tool slide travel on vertical ways, free of chip area . . . full chip control, including automatic breakage for disposal, and prevention of accumulations around operating parts . . . complete visibility and accessibility of work and tools . . . massive weight and over-all rigidity assure minimum vibration for maintained accuracy . . . Man-Au-Trol control, head stock and all other machine-operating controls are at operator's right.

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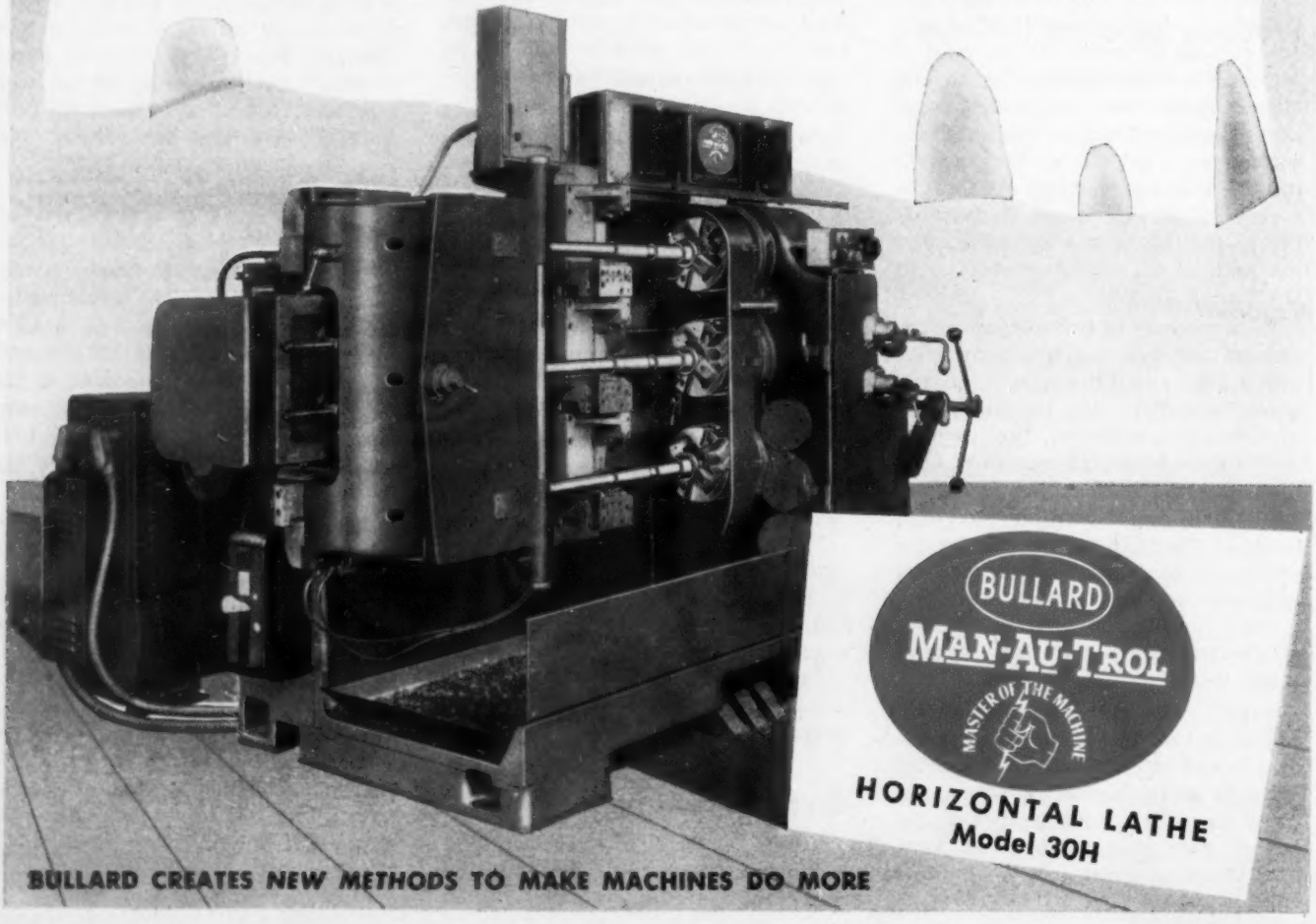
Providing manual operation on short runs, Man-Au-Trol enables quick conversion to 100% automaticity on longer runs. Controlling the head through *39 separate functions in any sequence*, it allows the machine to cut practically continuously, without stops for customary manual operations or loss of time due to the human element. While retaining the versatility of manual control for short runs, this new BULLARD machine can be quickly changed to fully automatic operation on production of 3 identical parts at once — substantially lowering manufacturing costs.

Why not find out how this cost-saving combination can benefit your own production? Engineering data and other facts on the new BULLARD Man-Au-Trol 3-Spindle Horizontal Lathe gladly sent on request. THE BULLARD COMPANY, Bridgeport 2, Conn.



BULLARD CREATES *NEW METHODS* TO MAKE MACHINES DO MORE

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Romney, back from ILO metal trades conference in Sweden, urges generosity for immediate relief of hungry Europeans, but advocates hard-boiled attitude toward pouring billions into long-term rehabilitation

DETROIT

WITH the plight of western Europe a subject uppermost in many minds, the observations of George Romney, managing director of the Automobile Manufacturers Association, just returned from a two-month visit to Sweden, Belgium, the Netherlands, France, Germany, Italy, Switzerland and Great Britain, are particularly timely. During his trip he attended the Metal Trades Industries conference of the International Labor Organization at Stockholm, Sweden, as an employer delegate, where he met with management-labor government representatives from 18 countries and attempted almost single-handed to sell the story of American free and competitive enterprise.

Mr. Romney divides the European mess into two phases—the first, the immediate or short-term hardships occasioned almost everywhere by what he terms a "natural catastrophe" in the form of an unusually harsh winter, a spring rain deluge and a prolonged drought during the past few months. Result, he says, has been a pronounced falling off in grain and dairy production, so much so that literally millions are facing starvation this winter. The second phase is the long-term reconstruction and refinancing problem.

Should Consider Each Separately

In Romney's opinion, the two should be kept entirely separate as far as U. S. consideration is concerned. The first, involving principally humanitarian aspects, can and should be relieved by concerted action by the American people and their scores of private relief agencies. He has already initiated a small and local movement to forego 50 per cent of one Sunday's food expenditures each month, the saving to be sent to European families direct in the form of food.

Granting the calamitous nature of the European food problem in the next few months, it is difficult to understand why the international Red Cross has not taken steps to offer its services and support, but apparently these have not been forthcoming. On top of this are the numerous conflicting reports coming out of Europe, such as this statement appearing in the Oct. 10 issue of a national news weekly: "President Truman is told that if European governments will just put the heat on their own farmers they will be assured of food well into 1948. Grain harvests in Europe were under perfect conditions, but farmers are tending to hoard their grain."

On the long-term phase of Europe's ills, tied in as they are with the spread of socialism and bureaucratic governments throughout Britain and the continent, a firmer stand is necessary, in Romney's opinion. He feels it futile to pour billions of U. S. taxpayers' dollars into countries where there is a general refusal to recognize the merits of "free and competitive enterprise" and where there is a near-universal feeling, in both high and low places, that "only America can afford the price of freedom and democracy." Both management and labor there will go along with the idea of free enterprise as long as that means only freedom from government interference, but they still cling to the old ideas of labor monopolies and cartels to fix prices and control production. Members of the metal trades industries at the Stockholm meeting, for example, were practically aghast at efforts to win approval to a resolution endorsing the principles of free and competitive enterprise.

Summing up, Romney is vehement in his plea for American help to relieve hunger in Europe this winter, although he is vague in outlining the mechanics of how this is to be done equitably and to circumvent the usual chiselers. Finally, he concludes, we should be just as hardboiled in making loans for European business and industry as we are generous in helping the "natural catastrophe" now blackening the war-ripped continent.

As a specific example of the food nightmare in France, Romney cited the case of the typical French automobile worker who earns approximately 75 francs an hour, or the equivalent of about $3 a day at official exchange rates, and who works possibly only three or four days a week because of the coal shortage or materials shortages. Stack this $9 or $10 weekly earnings against the fact only an average dinner in Paris costs the restaurant patron 5000 francs, or roughly $5, and the plight of the worker can be sensed. On top of this, there appears to be no incentive among operators of the few motor plants now functioning to boost their production, since government-imposed price ceilings often mean a loss on every vehicle produced.

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

Estimates by Ward's Automotive Reports

	1947	1946
January	373,872	126,082
February	399,717	84,109
March	441,798	140,738
April	449,388	248,108
May	390,629	247,620
June	418,919	216,637
July	396,932	331,100
August	360,221	359,111
September	451,490*	342,969
October		410,510
November		380,664
December		380,908
12 ms.		3,268,456

* Preliminary.

Estimates for week ended:

Sept. 20	109,734	80,826
Sept. 27	106,894	83,995
Oct. 4	103,443	91,925
Oct. 11	100,000	86,330

Ford To Build Third Stack

Convinced that the duration of the current shortage of flat-rolled steel has been far underestimated and may continue for another two years, Ford Motor Co. has inaugurated an $18 million program to balance out its steel plant and foundry operations by building a third blast furnace at the Rouge plant, extending ore and limestone docks, adding a second ore bridge, installing a temporary 84-in. skin pass cold finishing mill and related materials handling equipment and machinery.

Construction of the blast furnace will be under way in about two months, under supervision of Arthur G. McKee & Co., and extra pressure is being applied to have it in operation by next September. It will be located near the present blast fur-

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naces, between the electric furnace building and "B" furnace. The two furnaces now operated have combined capacity of around 1500 tons daily, so iron output will be virtually doubled, except that there is a likelihood of "B" furnace requiring extensive repairs before long. At any rate, the new blast furnace is calculated to release the entire capacity of one furnace to supply hot iron for the production gray iron foundry, along with taking the company out of the local steel scrap market where it has been buying important tonnage for a considerable length of time.

Additional iron capacity also will permit stepping up open-hearth production to a degree, by virtue of the fact more hot metal can be used in charges, thereby lowering heat time. Further, several of the smaller furnaces in the present battery of ten will be enlarged, and another hot metal car provided to transfer iron to open hearths. Present coke oven capacity is sufficient to handle the needs of the new blast furnace, and available ore supplies are not considered a problem.

The rolling mill equipment has been purchased from Granite City Steel Corp. and is a 42-in. mill which will be converted to an 84-in. skin pass type, thus appreciably extending capacity for cold rolling wide sheets. It is scheduled to be installed and operating by March of next year, although being regarded as only an emergency installation which will probably have outlived its usefulness after only a couple of years of production.

Looking to the Future

The Ford soiree for the Detroit section of the Society of Automotive Engineers at Dearborn Inn and the Museum of the Edison Institute last Monday drew a capacity crowd, with several hundred being turned away at dinner because of lack of facilities. However, they were all accommodated at the technical meeting following, where Harold Youngren, director of engineering, went back over the years in automobile design and engineering to show how new developments frequently must wait for a long time before the needs of the motoring public make their adoption feasible and profitable. Taking a look at cars of the future, he said more passenger space, more luggage space and a better ride were three musts on designers' lists, while the trend is in the direction of V-8 or horizontal-opposed type engines. He also hinted that heavier cars and the switch to the new superballoon tires might hasten the incidence of powered steering.

BENSON FORD

Brother of Henry Ford II, who in recent months has been acquainting himself with various activities of the Ford Motor Co., Dearborn, Mich., will now devote his efforts and interests to the Lincoln-Mercury Division, with headquarters in Detroit.

Addressing the dinner crowd, E. R. Breech, executive vice president, called for fresh engineering thinking on automobile design, pointing to the rapid strides made in aviation engineering under the impetus of the war. He urged the enrollment of more young engineering graduates in the industry as well as the effort to persuade more top-flight scientists from educational institutions to lend their talents to improving car design and lowering costs.

Willys To Show Facilities

Over 300 of the nation's leading industrialists, bankers, educators, editors, federal and state officials will be guests of Willys-Overland this week at Toledo, for the second annual institutional day held by the company. Special points of interest will be the firm's new $5 million press plant, now in production on truck bodies, a new body paint division covering 120,000 sq ft, a new four and six-cylinder engine line, and a nearly completed drop forge division with monthly capacity of around 2500 tons. Not in the official announcement but reported in the weekly, *Automotive News*, are the planned demonstrations of a new model called the "jeepster"—a touring car type with canvas top and side curtains with the jeep front and the jeep station wagon chassis—said to be a "college boy's dream," as well as a new 6-cylinder deluxe station wagon, or station sedan as it is called. Neither will be announced formally until next spring. The projected 6-cylinder Willys passenger car still seems to be resting on the shelf.

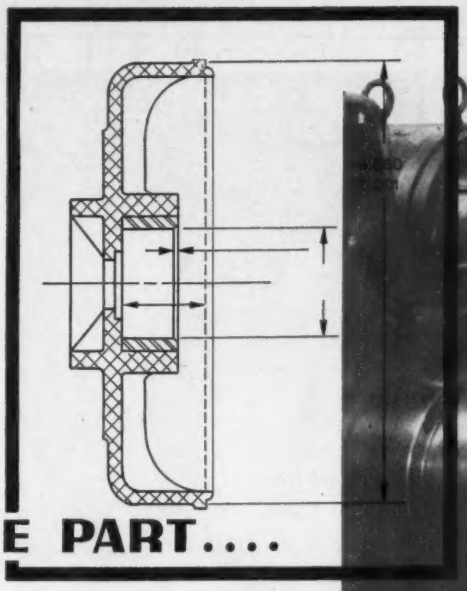
Reuther vs. Thomas

Full-scale knock-down and drag-out fight between the Reuther and Thomas factions of the UAW-CIO is capturing attention around Detroit. Latest episode was a so-called "debate" between the two union leaders at Flint, where there are perhaps 40,000 members working in plants in that area. The debate was attended by a couple hundred adherents who listened to the two participants call each other seven kinds of a prevaricator for the purpose of drumming up support for their votes at the Nov. 9 union convention in Atlantic City. The Thomas faction, supported by Richard T. Leonard, head of the large Ford UAW local, has hired a new press agent and at a recent special press conference unfurled a 37-page report to the membership, the principal purpose of which was to discredit Reuther, the union president.

One of the principal bones of contention between the two factions is the amount of money spent to organize the Thompson Products plant in Cleveland. The effort was a notorious flop, for five or six times, and in all the UAW spent about $300,000 on the job. Reuther claims the money was frittered away by his opponents who control a majority of the group's executive board. Thomas and his henchmen in turn denounce Reuther as a tool of employers and a friend of the Taft-Hartley law, both demonstrably ridiculous charges.

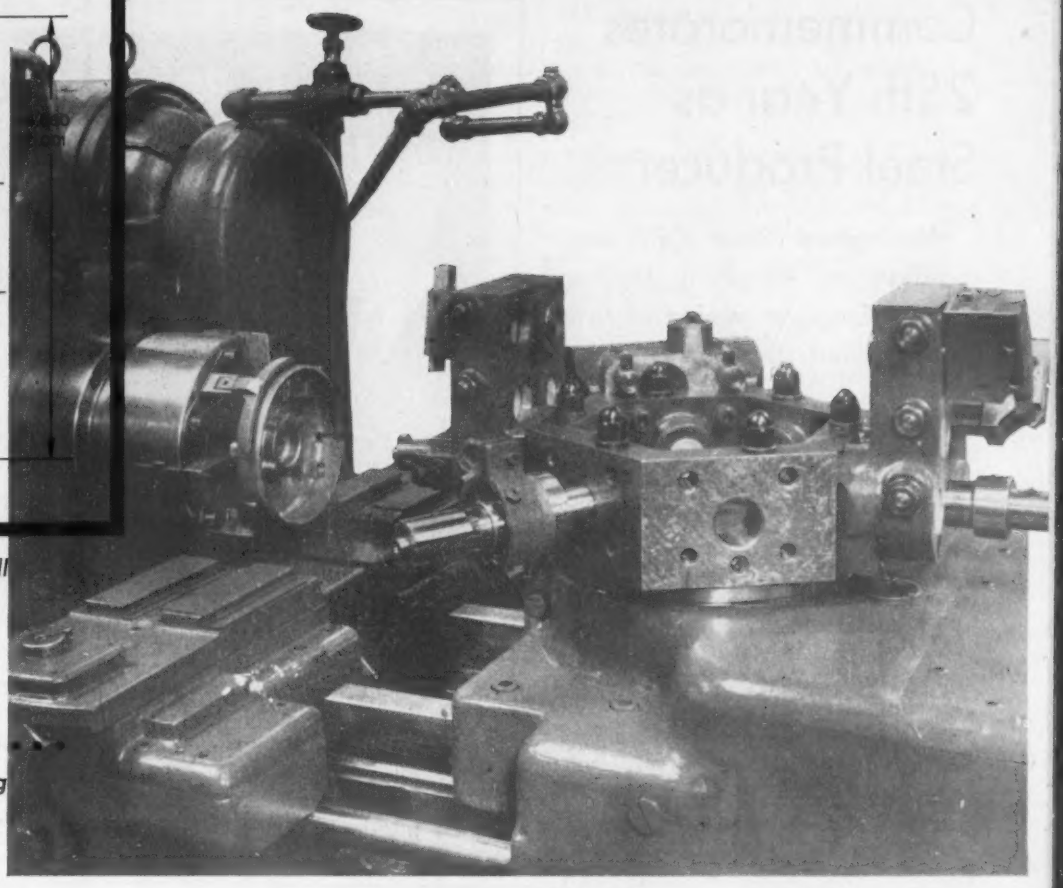
New Parts Distribution Plan

A realigned parts distribution plan will be placed in effect Nov. 1 by General Motors, covering all car, truck, diesel engine accessories and parts divisions, and involving the distribution and pricing of approximately 275,000 parts to different classifications of outlets, such as warehouse distributors, retailer-wholesalers or dealers, and independent retail shops. Pricing structure has been streamlined and is to be on a net price basis to all channels of trade, parts being classified into several groups—fast moving, moderately fast moving, slow moving, and those purchased on a demand basis.



THE PART....

(die cast aluminum motor end bell with steel insert)



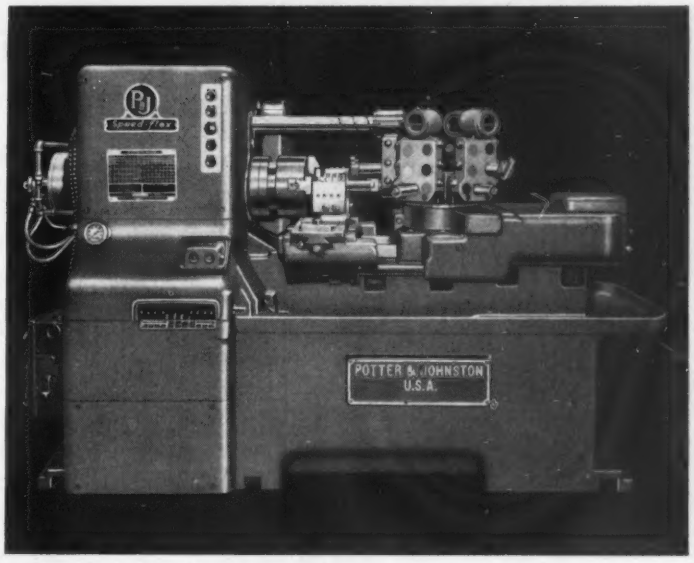
THE METHOD.....

(one operation, starting with boring hole in steel insert)

THE MACHINE.....

3-U SPEED-FLEX

automatic turret lathe



Here is a die cast aluminum motor end bell with a steel insert. The 3-U SPEED-FLEX, occupying only 16 square feet of floor space, TURNS OUT 42 PIECES AN HOUR! The 3-U SPEED-FLEX has been developed for machining castings and forgings—both ferrous and non-ferrous—up to 6 inches in diameter. Small size, wide range of operations: simple, convenient controls, quick chucking, speed and accuracy of all operations; these are factors of utmost importance, whether you are considering a single machine or a battery. Drop us a line. We will be glad to furnish a complete description. Better yet, send us blueprint—or part itself—for guaranteed production data.

Total cutting time (one operation)	1.05 minutes
Allowance for chucking	.15 seconds
Total time	1.20 minutes
Pieces per hour	42.5

Potter & Johnston Machine Co., Pawtucket, R.I.

Commemorates 25th Year as Steel Producer

Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp., produced its first cold rolled strip in 1922

WALLINGFORD Steel Co., Wallingford, Conn., subsidiary of Allegheny Ludlum Steel Corp., last week celebrated its twenty-fifth anniversary.

The firm was organized in 1922 as a producer of cold rolled strip steel by Edmund B. Cleborne, present president, the late Gilbert D. Boyd and others. When operations started, the company was equipped with five stands of 14-inch mills, a single stand finishing mill and two small mills.

Began Experiments—In 1925 Wallingford began experiments with a stainless steel which eventually led to adoption of stainless as part of its line. Subsequent research and experimentation has resulted in the inclusion of stainless alloys, low carbon, high carbon and other specialty steels in the firm's list of products.

Steady modernization of equipment has featured Wallingford's 25-year history. In 1933 a four high 29 inch reversing mill, rated the largest rolling facility in New England, was installed. Extensive electric, gas and oil equipment has also been added, particularly in the annealing department where two coal-fired furnaces have been changed.

Since the war's end, the company has been continuing an expansion program, and at present a new addition is nearing completion. During the war the company devoted all its production to cartridge clip steel. Today Wallingford has 325 employees, 15 of whom have been with it since 1922.

Bought by Ludlum—In 1935 Ludlum Steel Co. acquired the company, which continued, however, to operate individually with Mr. Cleborne remaining as president, a position which he had first assumed in 1931. In 1938, upon the merger of Ludlum with Allegheny to form Allegheny Ludlum Steel Corp., Wallingford became an operating subsidiary of the new corporation.

Present officers of the firm, in addition to Mr. Cleborne, are Gerald J. Griffin, vice president; William H. Grinold, vice president; and E. J. Hanley of Allegheny Ludlum Steel Corp., secretary and treasurer.

Mr. Cleborne, a vice president and director of Allegheny Ludlum since 1938, was recently elected executive vice president of Allegheny Ludlum.

MERIT AWARDS: Allegheny Ludlum Steel Corp. rewarded two employees for developmental work which has led to increased production in the steel and coal industries. Robert T. Eakin, left center, was honored for developing a new coal mining bit, and Glenn E. Hilliard, right center, for developing techniques for using oxygen for carbon reduction in steelmaking. Awards include medal, citation and $1000 in cash each. Medals were presented by H. G. Batcheller, president, left, and W. F. Detwiler, board chairman, right

100th Anniversary Observed By International Harvester

International Harvester Co. this month observes its 100th anniversary in Chicago with a variety of events which include an exhibit at Soldiers Field showing a century of progress in farm machinery and the formal opening of the firm's new company-wide manufacturing research department.

The research facility is at 5225 S. Western Ave., Chicago, in a building acquired about a year ago from WAA. While the company always has carried on a manufacturing research program, the changing character and requirements of its business in recent years have demonstrated the need for a more highly developed approach to this phase of research work.

Cyrus Hall McCormick, who invented his first reaper on the family farm in 1831, built a factory on the north side of the Chicago river near its mouth in 1847 and here the first factory-built reapers were made. The facility stood there until 1871 when it was destroyed by the Chicago fire. A new plant was set up at the company's present McCormick Works, Blue Island and Western Aves.

The present International Harvester Co. represents a merger which was effected in 1902, involving McCormick Harvesting Machine Co., Deering Harvesting Machine Co., Plano Co., Milwaukee Harvest Co. and Warder-Bushnell-Blessner Co., Springfield, O. The first three firms were all located in Chicago.

Armco Open House Draws 18,000 at Butler, Pa., Plant

American Rolling Mill Co. recently held a 4-day open house program at its Butler, Pa., plant, in honor of company's 20th anniversary at that location. In addition to key company management and production officials, over 18,000 persons visited the plant's major operating departments.

C. R. Hook, president of American Rolling Mill Co., stated $24.5 million has been allocated for capital improvements to the Butler plant. Since 1944 about $11.5 million of this sum has been used in constructing new equipment as well as enlarging and modernizing existing facilities. Company's overall money outlay for expansion and modernization totals $68 million.

BRIEFS . . . .

Paragraph mentions of developments of interest and significance within the metalworking industry

Bendix Home Appliances Inc., South Bend, Ind., announces it produced 60,000 automatic washers in September, an all-time high. The company also manufactured a record number of automatic clothes dryers—over 6000—and approximately 5000 ironers.

—o—

Ahlberg Bearing Co., Chicago, manufacturer and distributor of ball bearings, reports that it has added ball bearings made by Jack & Heintz Precision Industries Inc., Cleveland, to its service line.

—o—

General Electric Co., Schenectady, N. Y., is now accepting applications for the scholastic year, 1948-49, from college graduates who wish to receive grants to undertake or continue research work in scientific and industrial fields. This is the twenty-fourth consecutive year in which the company has granted such fellowships from the income of a $1 million fund.

—o—

Carrier Corp., Syracuse, N. Y., manufacturer of heating, ventilating, air conditioning and refrigeration equipment, has acquired title to an industrial plant at Syracuse built by the Navy in 1942. Purchase was made from WAA as a part of Carrier's $12 million expansion program.

—o—

Department of Labor recently published a report on the apprentice training program of the Tennessee Valley Authority which covers the project's operation in 15 crafts since 1938.

—o—

Rack Engineering Co., Pittsburgh, manufacturer of rack conveyors and storage pans and pegs, plans to establish a branch plant in Sweden.

—o—

Bliss & Laughlin Inc., Harvey, Ill., manufacturer of cold drawn steel, has appointed Lawrence-Totten Co. as its district sales representative on the Pacific Coast. The sales organization has offices in Los Angeles, San Francisco and Seattle.

—o—

Goodyear Tire & Rubber Co., Akron, reports in a review of the first two postwar years in the rubber industry that the tire shortage of V-J Day will be filled by the end of the year with the price less than the 1939 list price.

—o—

War Assets Administration reveals that its Real Property Review Board has recommended the sale of isopentane production facilities in Texas City, Tex., to Pan American Refining Corp., for $411,500.

—o—

Hamilton Rubber Mfg. Corp., Trenton, N. J., manufacturer of industrial rubber products, has opened a branch office and warehouse in Houston, Tex., at 2017-19 Preston Ave. under the direction of W. A. Olivier.

—o—

War Assets Administration reveals that its Real Property Review Board has recommended that a steel foundry in Springfield, Mass., be sold for $916,500 to Chapman Valve Mfg. Co., wartime operator.

—o—

Acme Steel Co., Chicago, recently honored 184 employees who have 25 or more years of service.

—o—

Micromatic Hone Corp., Detroit, manufacturer of honing tools, fixtures and special machines, has received a first award from Detroit Trust Co., following a survey and judging of outstanding company annual reports in the Detroit area.

—o—

Chrysler Corp., Detroit, reports that in the past 20 years it has manufactured more than 245,000 marine and industrial engines and that today it is the largest producer of marine engines in the United States and one of the four leading makers of industrial engines.

—o—

Salmon & Co. Inc. has just opened offices and a warehouse at 2822 Fifth Ave., Birmingham. Firm will be engaged in sales distribution of mining, quarrying, contracting and industrial equipment, tools and supplies.

—o—

Scott Aviation Corp., Lancaster, N. Y., has acquired manufacturing and sales rights from "Easy-tote" Products Co., formerly of Arcade, N. Y., of a materials handling truck.

—o—

R. G. LeTourneau Inc., Peoria, Ill., manufacturer of earth-moving machinery and related equipment, announces opening of an office for its Tournalayer Sales Division at 5007 E. Washington Blvd., Los Angeles. This division handles sales of specialized pieces of equipment, including a machine that casts a concrete house unit in a day's time.

—o—

Meehanite Metal Corp., New Rochelle, N. Y., announces that an annual convention of the manufacturers of Meehanite castings will be held in Cleveland, Nov. 6-8, at Hotel Carter.

—o—

Chicago Steel Treating Co., Chicago, has been acquired by Robert B. Seger and Andrew L. Olson, formerly with Lindberg Steel Treating Co. The firm will continue to serve Chicago area fabricators with facilities for all phases of metal treating.

—o—

American Washer & Ironer Manufacturers' Association, Chicago, reports that factory sales of standard-size household washers in July totaled 281,826, compared to 314,705 in June and 166,559 in July, 1946. Ironers sold in July totaled 41,911, compared to 52,025 in June and 7646 in July, 1946.

—o—

American Steel & Wire Co., Cleveland, U. S. Steel subsidiary, will hold an open house at its Cuyahoga works Nov. 3.

—o—

Youngstown Sheet & Tube Co., Youngstown, announces its Campbell plant operated from October, 1942, to April, 1947, without a lost time accident.

—o—

Timken Roller Bearing Co., Canton, O., will establish a branch plant in Bucyrus, O., in buildings now occupied by Smith Tool & Engineering Co. which plans to move to Cleveland about Jan. 1.

—o—

Jorg Inc., maker of automotive parts, will establish its main plant and office at Franklin, Ind., in a factory building now being remodeled. It formerly was located in Columbus, Ind.

—o—

Smiths Falls Malleable Castings Ltd., Smiths Falls, Ont., Canada, which last April suffered a severe fire, has been reorganized and refinanced and expects to resume operations about Dec. 1.

—o—

Can Manufacturers Institute, Washington, cites a steady increase in consumption of tin plate for beer cans with 59,856 tons shipped during the first half of 1947, compared with almost none for the same period in 1946.

—o—

General Motors Corp., Detroit, announces that its common and preferred stockholders for the third quarter of 1947 numbered 436,917, compared with 437,932 for this year's second quarter and 428,874 for the third quarter of 1946.

The Business Trend

Industrial Activity Rate Drops Slightly from Peak

EASING OFF slightly from the postwar peak established in the previous week, STEEL's industrial production index for the week ended Oct. 4 registered 165 per cent (preliminary) of the 1936-1939 average.

The one-point decline resulted from slight reductions in automobile and truck output and electric power distribution, which were not completely offset by a fractional gain in the national steel ingot rate to 94.5 per cent of capacity.

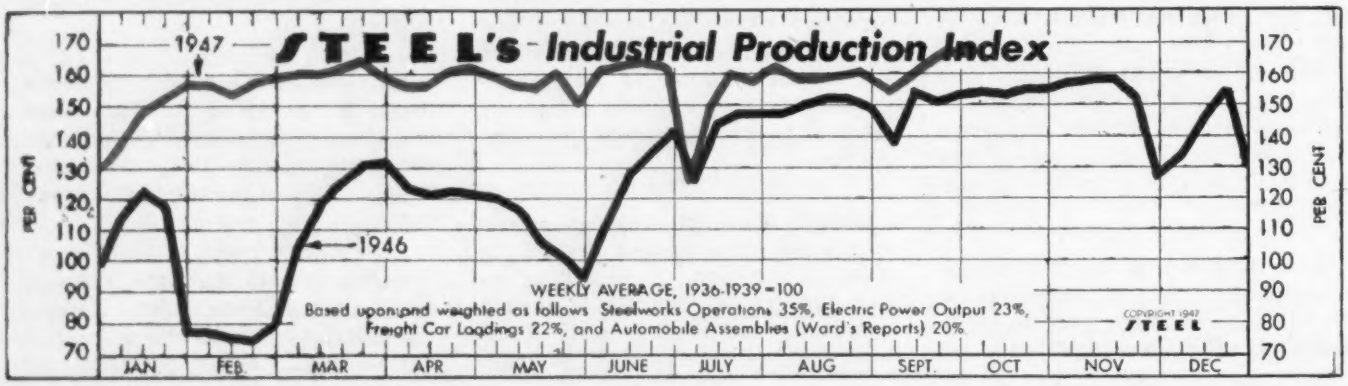
PRICES—The first decline in wholesale prices in 13 weeks occurred in the week ended Sept. 27 when generally lower prices for agricultural commodities brought the Bureau of Labor Statistics index down 1.2 per cent to 156.2 per cent of the 1926 average. Industrial raw materials and manufactured goods also registered declines in the latest week, dropping 1.4 per cent and 1.2 per cent to 171.1 and 150.9 per cent, respectively.

CONSTRUCTION—Volume of domestic civil engineering construction reached its second highest postwar level in the week ended Oct. 2 at $166,812,000, having been exceeded only during the week ended June 6, 1946, when construction volume was $182,168,000. Private construction accounted for $130,241,000 of the total and set a postwar record for this class of work.

CARLOADINGS—Freight carloadings in the current quarter are expected to be 6.2 per cent above those in the comparable period of 1946, according to estimates by the 13 Shippers Advisory Boards. On the basis of these estimates loadings of the 32 principal commodities will require 8,077,063 freight cars. Increases in loadings are expected in 26 commodities and decreases in 6.

FOREIGN TRADE—Volume of exports steadied in August at $1148.5 million, compared to $1151 million in July, the Department of Commerce reported. This slight decrease is in sharp contrast to the drops which have been recorded since the postwar peak of $1421.5 million was reached in May. June exports were about $200 million below that figure and July's total was an additional $100 million lower. Despite recent declines, however, the monthly average for the first eight months of this year is still more than 25 per cent greater than the 1946 monthly average. Imports in August at $399 million, or 11 per cent below the July figure, were the lowest since October, 1946.

MANUFACTURERS' SALES—Recovering from the decline experienced in July, August sales by manufacturers were $300 million, or 2 per cent, higher at $13.4 billion for the month. More than two-thirds of the increase in sales occurred in the durable goods group, where all of the July decline had been concentrated, according to a preliminary report by the Department of Commerce.



The Index (see chart above): Latest Week (preliminary) 165 Previous Week 166 Month Ago 153 Year Ago 154

FIGURES THIS WEEK

INDUSTRY	Latest Period*	Prior Week	Month Ago	Year Ago
Steel Ingot Output (per cent of capacity)†	94.5	94.0	93.0	90.5
Electric Power Distributed (million kilowatt hours)	4,935	4,956	4,721	4,478
Bituminous Coal Production (daily av.—1000 tons)	2,050	2,040	2,005	2,144
Petroleum Production (daily av.—1000 bbl.)	5,208	5,196	5,173	4,737
Construction Volume (ENR—Unit $1,000,000)	$166.8	$135.2	$122.8	$133.7
Automobile and Truck Output (Ward's—number units)	103,443	106,894	83,444	91,925

* Dates on request. † 1947 weekly capacity is 1,749,928 net tons. 1946 weekly capacity was 1,762,381 net tons.

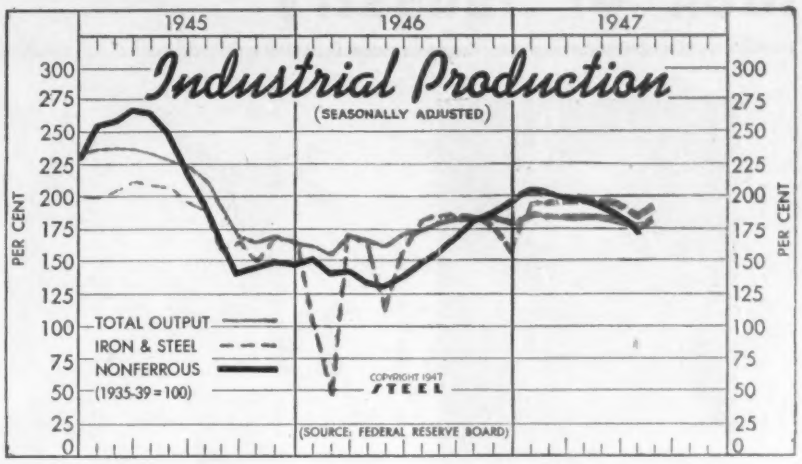
TRADE				
Freight Carloadings (unit—1000 cars)	930†	938	809	907
Business Failures (Dun & Bradstreet, number)	70†	77	60	28
Money in Circulation (in millions of dollars)‡	$28,559	$28,556	$28,749	$28,526
Department Store Sales (change from like wk. a yr. ago)‡	+24%	+7%	—1%	+23%

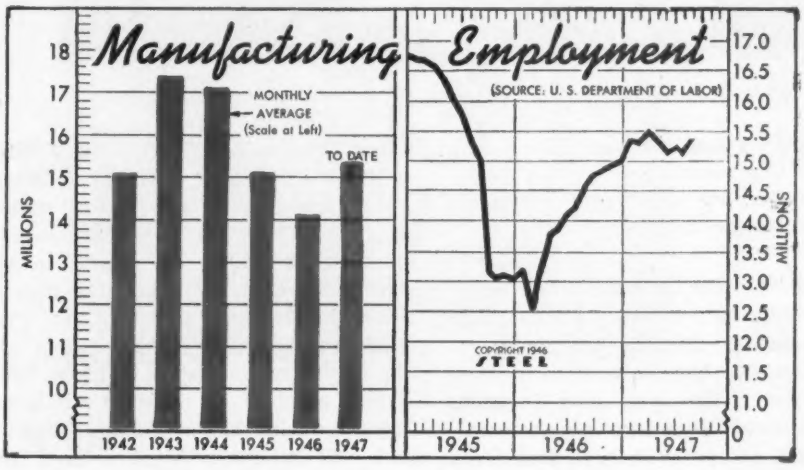
† Preliminary. ‡ Federal Reserve Board.

Federal Reserve Board's Production Indexes

(1935-39=100)

	Total Production		Iron, Steel		Nonferrous	
	1947	1946	1947	1946	1947	1946
Jan.	189	160	192	102	204	150
Feb.	189	152	191	43	205	141
Mar.	190	168	196	169	199	139
Apr.	186	165	195	159	197	132
May	185	159	197	109	187	128
June	184	170	193	154	179	137
July	177	172	181	180	172	151
Aug.	182	178	187	184	...	159
Sept.	...	180	...	185	...	172
Oct.	...	182	...	184	...	184
Nov.	...	183	...	178	...	192
Dec.	...	182	...	159	...	197
Ave.	...	171	...	150	...	157





Factory Employment

(000 omitted)

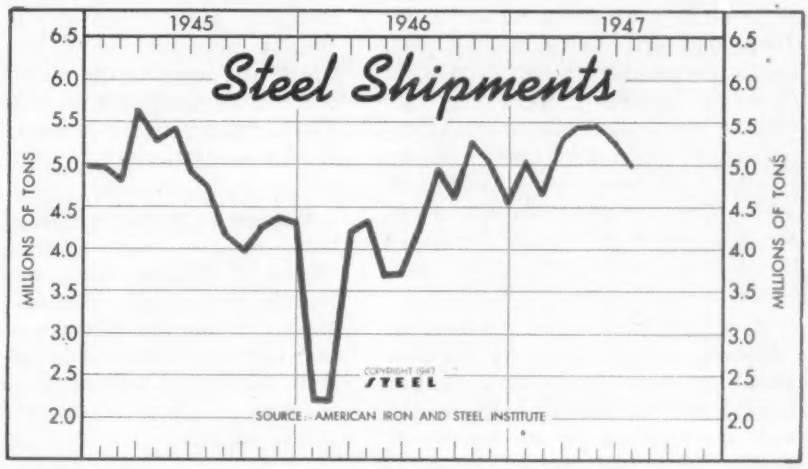
	1947	1946	1945
January	15,372	13,499	16,696
February	15,475	12,751	16,684
March	15,510	13,433	16,557
April	15,429	14,045	16,302
May	15,237	14,159	16,012
June	15,327	14,371	15,749
July	15,170	14,526	15,331
August	15,484	14,876	15,019
September	.....	15,035	13,159
October	.....	15,064	13,048
November	.....	15,271	13,110
December	.....	15,348	13,059
Monthly Ave...	.....	14,365	15,060

Steel Shipments

(Net Tons)

	1947	1946	1945
Jan.	5,061,333	2,189,369*	4,940,160
Feb.	4,626,424	2,189,368*	4,776,377
Mar.	5,304,415	4,213,913	5,632,155
Apr.	5,445,993	4,335,694	5,254,064
May	5,442,343	3,666,677	5,417,051
June	5,263,711	3,687,509	4,891,228
July	4,974,566	4,259,494	4,696,895
Aug.	.....	4,965,456	4,123,578
Sept.	.....	4,589,902	3,955,198
Oct.	.....	5,260,832	4,267,177
Nov.	.....	5,019,984	4,366,567
Dec.	.....	4,533,420	4,297,502

* Figures for January and February, 1946, are merely averages derived from a report that combined shipments for those two strike-affected months into a total of 4,378,737.



FINANCE

	Latest Period*	Prior Week	Month Ago	Year Ago
Bank Clearings (Dun & Bradstreet—millions)	$13,580	$13,026	$10,125	$12,432
Federal Gross Debt (billions)	$259.4	$259.0	$260.0	$263.8
Bond Volume, NYSE (millions)	$23.1	$16.4	$13.3	$24.0
Stocks Sales, NYSE (thousands)	5,404	3,532	2,892	5,115
Loans and Investments (billions)†	$64.6	$64.7	$63.7	$59.1
United States Gov't. Obligations Held (millions)†	$38,680	$39,022	$38,395	$39,990

† Member banks, Federal Reserve System.

PRICES

STEEL's composite finished steel price average	$75.41	$75.41	$75.41	$64.45
All Commodities†	156.2	158.1	154.0	124.4
Industrial Raw Materials†	171.1	173.6	167.9	143.6
Manufactured Products†	150.9	152.7	148.9	117.5

† Bureau of Labor Statistics Index, 1926=100.

Men of Industry

WALTER J. MAHANY

V. A. CROSBY

STANLEY M. RUMBOUGH JR.

Walter J. Mahany, associated for more than 20 years with the Southern States Iron Roofing Co., Savannah, Ga., has been named vice president of operations. He was elected a director of the company last year. During the war Mr. Mahany was manager of the Birmingham factory where the company turned out bomb fin assemblies and prefabricated hospital buildings for the Army and Navy. Since 1945, he has been manager of Birmingham operations, in charge of the company branches at Nashville, Tenn., and Hattiesburg, Miss., as well as the Birmingham facilities. He returns to Savannah, where he now will be responsible for manufacturing, engineering, personnel, property maintenance, construction and branch supervision. **Hugh O. Nash** succeeds Mr. Mahany as director of the firm's Birmingham operations.

—o—

H. C. Edwards, chief engineer of research and development, Timken Roller Bearing Co., Canton, O., has been appointed director of research and development to succeed **J. F. Leahy,** who has retired after 45 years' service with the company.

—o—

Universal Winding Co., Providence, R. I., announces appointment of **C. Foster Harry** as vice president in charge of manufacturing, a new position in the organization. He formerly had been engineering field supervisor with Rath & Strong Inc., Boston.

—o—

H. M. Shank, Boston branch manager, Service-Sales Division, Timken Roller Bearing Co., Canton, has been appointed Detroit branch manager to succeed **J. D. Jesseph,** who resigned to enter the automotive parts agency business. **Frank M. Barry,** formerly a field representative in the New York office, has been named manager of the Boston branch.

—o—

V. A. Crosby, metallurgical engineer in charge of sales, service and development, Climax Molybdenum Co., Detroit, has been chosen vice chairman of the Gray Iron Division of American Foundrymen's Association. He will succeed **R. G. McElwee,** who recently assumed the chairmanship. Mr. Crosby will also head the division program and papers group, which will organize the technical sessions to be sponsored at AFA's convention and foundry show in Philadelphia next May 3-7.

—o—

William D. McIntyre has been elected executive vice president and treasurer, Monroe Auto Equipment Co., Monroe, Mich. **Charles S. McIntyre** has been named vice president in charge of sales, and secretary. **J. E. Bickel** has been appointed sales manager, Parts & Accessory Division of the company.

—o—

Harry M. Day has been appointed vice president in charge of manufacturing for eight domestic plants of Ekco Products Co., Chicago. He had been director of research and technical assistant to the president of the company.

—o—

E. W. Meyers Jr. has been elected president of Trion Inc., Pittsburgh, succeeding **Paul W. Aitkenhead,** who has resigned to become chairman of the board.

—o—

William J. Gazey has been appointed executive vice president and general manager of the Massillon, O., Aluminum Co., subsidiary of Ekco Products Co., Chicago. Mr. Gazey, who has been general production manager for Ekco, also becomes executive vice president and general manager of Ekco's Byesville, O., plant. **John J. Harding,** president of the Massillon company, and a member of the executive committee of Ekco, will devote more of his time to administrative duties and sales in Chicago, but will maintain his residence in Massillon.

—o—

Stanley M. Rumbough Jr., director and secretary of the White Metal Mfg. Co., Hoboken, N. J., has been appointed director of sales, a position created by the company as part of an expanded sales program. He has been vice president in charge of sales and traffic of Willis Air Service, which he helped organize after his discharge from the Marine Corps. He remains a director of that company.

—o—

R. S. Neblett, manager for the past two years of the Federal & Marine Divisions, General Electric Co., Schenectady, N. Y., has been named administrator of the company's Nucleonics Project. **Bruce R. Prentice** will serve as Mr. Neblett's assistant on this project, which consists of work on atomic energy for the U. S. Atomic Energy Commission. **W. W. Hollo** has been appointed New York district representative for the wire and cable section of the company.

—o—

John F. Howe, formerly associated with the Paint Division, E. I. du Pont de Nemours & Co., Wilmington, Del., for the past 24 years, has joined the Eastern States Paint & Varnish Co., Philadelphia, as vice president. He will be in charge of paint sales of

HARPER fastening NEWS

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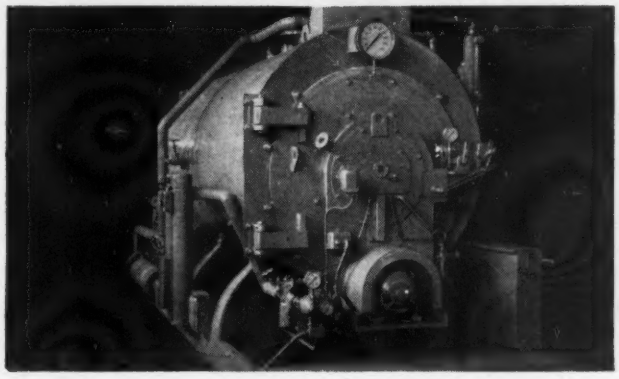
OF HARPER NON-FERROUS AND STAINLESS STEEL FASTENINGS

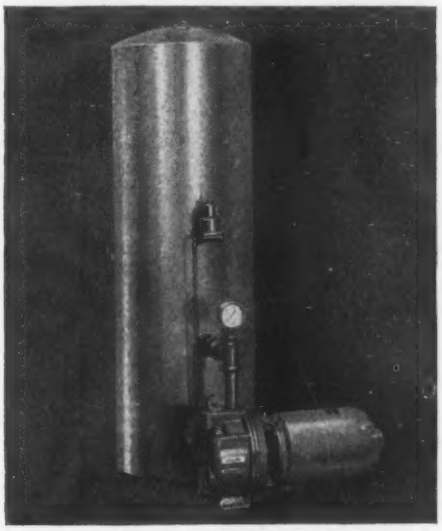


BOILER MAINTENANCE SIMPLIFIED

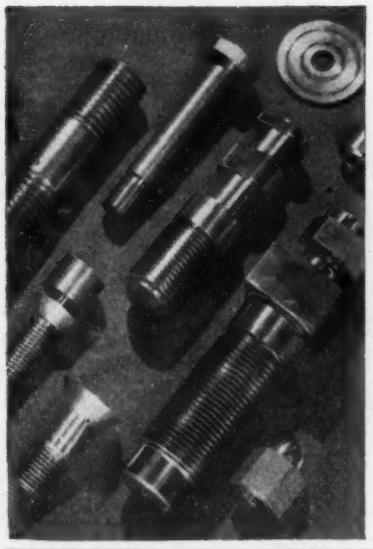
A large manufacturer of steam generating equipment employs Harper non-rusting, non-corroding brass nuts to fasten face plates on boilers. This service requires strength and non-corrosive properties, in the presence of moisture, to permit removal of plates for servicing. Brass, Bronzes, Monel Metal and Stainless Steels, used exclusively by Harper, will not rust or corrode.

AVOIDING TROUBLE IN PUMPS

Fastenings for internal parts of a well-known water well pump are specified as Harper non-ferrous. This means that the manufacturer can assemble the units and be certain that rust and corrosion will not attack the vital "works" of the pump. Longer life and minimum maintenance are the result. . . . Although rust and corrosion are commonly associated with water and brine, there are many other agents which are harmful to common steel. Whatever your problem, the solution may be in the use of non-ferrous or stainless steel.



VISIT OUR EXHIBIT — METAL SHOW CHICAGO Oct. 18-24 — BOOTH No. 1910



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A special department for manufacturing fastenings of the heavy machine type is an outstanding service at Harper. Any quantity, any size, any shape, any non-ferrous or stainless steel alloy can be made quickly to almost any required tolerance. Ask us about any fastening of a special nature that you require.

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HARPER SPECIALIZES IN EVERLASTING FASTENINGS

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—o—

G. Edward Conn Jr., Allis-Chalmers Mfg. Co., Milwaukee, has been named manager of the newly established branch office at York, Pa. He will be assisted in that position by **MacGregor G. Jones,** former resident representative at the Harrisburg, Pa., branch office.

—o—

Navy Pier Branch, University of Illinois, has added three new members to its foundry and pattern shop instruction staff: **S. S. Silberg,** instructor in mechanics; **Glenn E. Cramer,** instructor in pattern design and foundry practice; and **Roy W. Schroeder,** instructor in foundry laboratory and pattern design.

—o—

Harry M. Reed has been elected to the position of secretary of the board of Vanadium-Alloys Steel Co., Latrobe, Pa. Connected with the company since 1927, he has been assistant treasurer of the company's cold drawn products subsidiary, Anchor Drawn Steel Co. He succeeds the late **Fred P. Underwood** in his new position.

—o—

Thomas J. Desmond has been appointed sales manager for heavy chemicals, Grasselli Chemicals Department, E. I. du Pont de Nemours & Co., Wilmington, Del., to succeed the late **Howard E. Davis.**

—o—

In mentioning the appointment of **William E. Boyce** as manager of jobber sales, Micamold Radio Corp., Brooklyn, N. Y., STEEL, Sept. 29 issue, page 70, erroneously reported that Mr. Boyce formerly had held the position of general sales manager of the corporation. This was incorrect in that Mr. Boyce has just joined the firm. The general sales manager at Micamold is **Edmond B. Tyler.** Mr. Tyler continues in that position while Mr. Boyce is in charge of jobber sales only.

—o—

A. C. Berges will handle the Verson line of hydraulic and mechanical presses and press brakes in the Detroit territory for **L. Ray** and **Fred L. Phipps,** Michigan representatives of the Verson Allsteel Press Co., Chicago.

—o—

Robert J. Peck has been appointed New York district manager of the Electric Products Co., Cleveland.

—o—

R. H. Newton has been appointed to a newly created office of manager of dealer sales for the Lincoln Electric Co., Cleveland. Recently district sales manager at Minneapolis, Mr. Newton will now franchise and organize welding equipment dealers throughout the entire country.

—o—

Edward J. Barcalo has retired as a director of Associated Industries of New York State Inc., an organization he served constantly since he founded it and became its first president in 1914. **Nelson M. Graves,** president, Barcalo Mfg. Co., Buffalo, has been elected to succeed Mr. Barcalo.

—o—

The James F. Lincoln Arc Welding Foundation, Cleveland, announces appointment of **Prof. R. S. Green** of the department of industrial engineering of Ohio State University as editor-in-chief of the foundation's new book "Design For Welding."

—o—

The Oregon chapter of the Institute of Scrap Iron & Steel Inc. announces the results of its election as follows: **Maurice J. Rosenfeld,** California Bag & Metal Co., Portland, president; **Jack Rosenfeld,** Zidell Machinery & Supply Co., Portland, vice president; **Arthur Waltuck,** Standard Junk Co., Portland, secretary; and **Jack N. Barde,** Barde Steel Co., Portland, re-elected treasurer.

—o—

Max Hansen, German scientist, has been appointed associate professor of metallurgical engineering at Illinois Institute of Technology. One of the world's leading nonferrous physical metallurgists, Prof. Hansen recently made a compilation of German scientific progress during the war years for the technical field information agency of the United States Office of Military Government in Germany.

—o—

Eric V. Murray has been appointed assistant to the general sales manager, Atlas Steels Ltd., Welland, Canada. Prior to joining the Atlas organization in 1935, Mr. Murray had been associated with the Dominion Steel & Coal Corp., New Glasgow, N. S.

—o—

C. James Gardner, formerly chief of the machinery, metals & chemicals section, Export Division, Department of Trade & Commerce, Ottawa, has been appointed Toronto branch manager for the Jessop Steel Co., Washington, Pa.

—o—

John G. Caley, recently connected with Carley Trailer & Equipment Co., Atlanta, Ga., has been appointed manager of the national accounts department, Southern Division, Mack Trucks Inc., New York. He will maintain headquarters at Atlanta.

—o—

J. G. Phillips, vice president and treasurer, International Business Machines Corp., New York, has been elected executive vice president of the corporation. **Thomas J. Watson Jr.,** vice president and a director of the corporation, has been elected to the executive and finance committee; **A. L. Williams,** controller, elected treasurer; **Herbert T. Hansford,** assistant controller, succeeds to the post of controller; and **Bernard Wiegard,** general auditor, becomes assistant controller.

—o—

R. J. Hull has been named factory manager, **M. C. Pierce,** technical representative in tire construction, and **O. J. Dahl,** technical representative in compounding, for a rubber plant in Holland, with which the B. F. Goodrich Co., Akron, has become associated. The new Holland company is known as N. V. Nederlandsch-Amerikaanasche Autobanderfabriek, located in Enschede, a suburb of the Hague, Netherlands city.

—o—

H. E. Johnson has been appointed Chicago district manager of Alloy Steel Products Co., Linden, N. J., manufacturer of corrosion resistant valves & fittings. He previously had been with Edward Valves Inc. in the Chicago area.

—o—

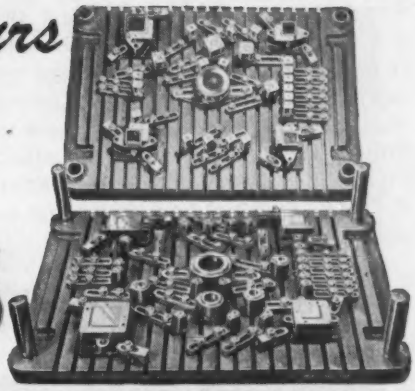
J. D. McCall has been named general superintendent of the Pittsburg, Calif., plant of Columbia Steel Co., U. S. Steel subsidiary, to succeed **J. A. White** who has resigned. Other appointments made are: **D. E. Rice,** assistant general superintendent; **Donald W. Lasell,** division superintendent of the sheet and tin mill; **Charles C. Morgan,** assistant division

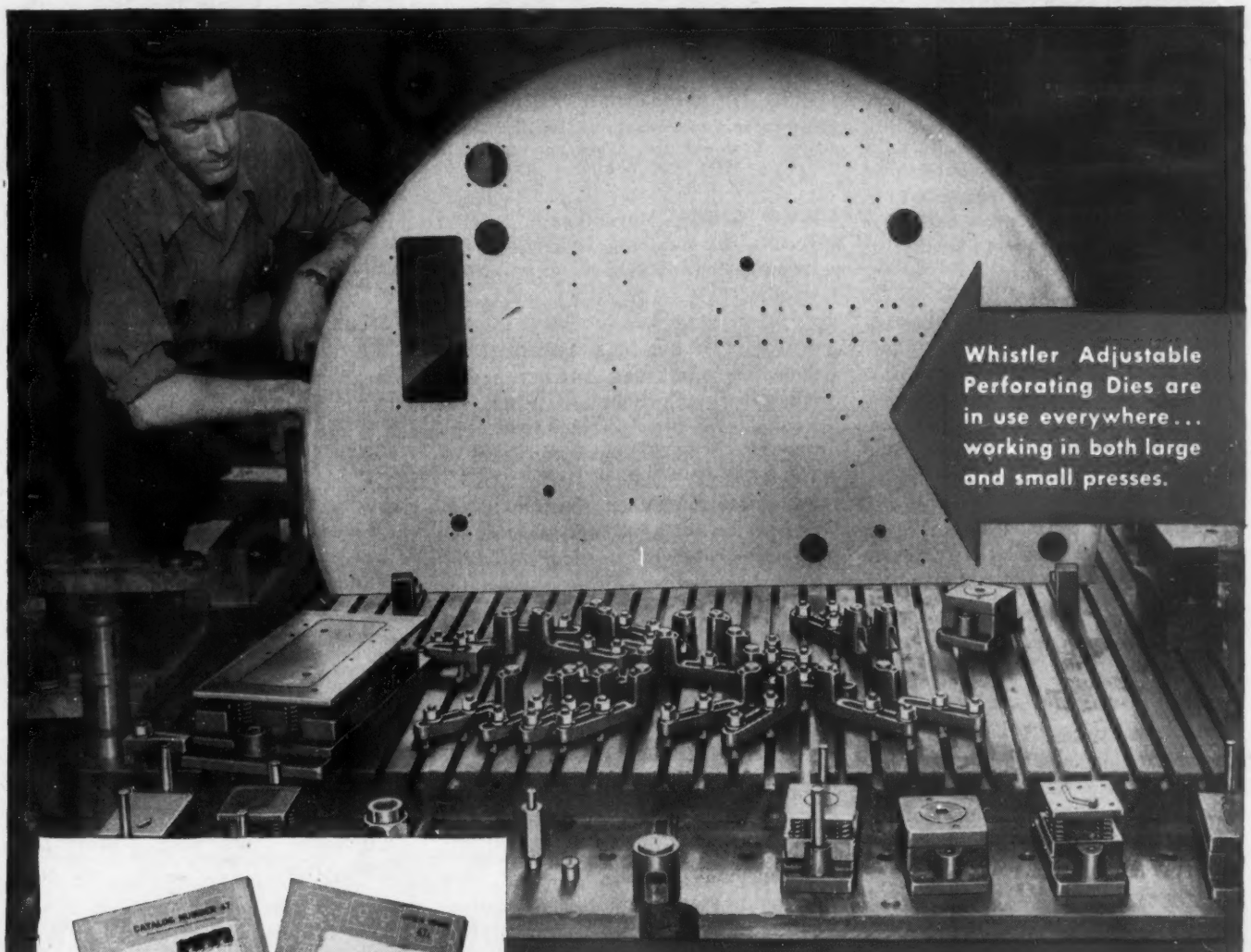
D. N. MACCONEL

Newly elected president, American Machine Tool Distributors' Association. He is president, Machinery Sales Co., Los Angeles. Noted in STEEL, Sept. 22 issue, p. 45

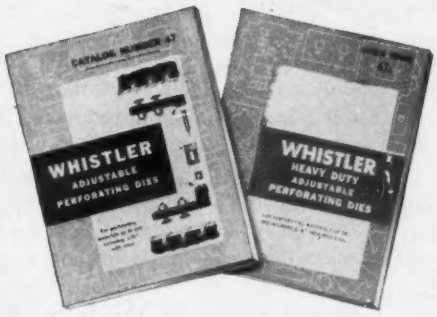
Get into Production in a few hours

with **WHISTLER ADJUSTABLE DIES**





Whistler Adjustable Perforating Dies are in use everywhere... working in both large and small presses.



There are plenty of other advantages in using Whistler Adjustable Dies. It makes sense to get the complete story. And it's easy to do. Write for your Whistler Catalogs today.

See us at Booth 301 National Metals Show, Chicago October 18th to 24th

Whistler perforating dies now offer a double-barreled advantage in getting into production faster. Standard sizes of round hole punches and dies... 1/32 to 3"... can be shipped promptly. Special shapes... squares, ovals, rectangles, group and notching dies, are quickly made to order.

Equally important, set-ups are simple... take only a short time. Same units can be rearranged or units added in setting up different jobs. Production is thus speeded while die costs are amortized through continued re-use.

No special tools are needed. All parts are interchangeable. The heavy duty series of punches and dies easily pierce materials up to 1/4" mild steel.

S. B. WHISTLER & SONS, Inc.

756 MILITARY ROAD, BUFFALO 17, NEW YORK

superintendent of the sheet and tin mill; **William L. Clark,** superintendent of cold reduction at the sheet and tin mill; **T. L. Carroll,** chief industrial engineer of the operating department; **Edwin E. Slagle,** works industrial engineer; **Walter W. Tryon** and **Eliot R. Peck,** assistants to works industrial engineer.

—o—

Lance H. Cooper, London, Eng., for 20 years a member of Mond Nickel Co., British subsidiary of International Nickel Co. Inc., New York, has been elected an assistant secretary and assistant treasurer of International Nickel Co. of Canada Ltd.

—o—

Ernest W. Polley has been appointed assistant chief chemist for the Youngstown district of Youngstown Sheet & Tube Co. He succeeds **L. C. Flickinger,** who recently had been appointed chief chemist following the death of **D. A. Russell.**

—o—

Adalet Mfg. Co., Cleveland, has appointed **Johan C. H. Larsen** as factory representative covering northern Ohio. He formerly had been with the W. Bingham Co., Cleveland, and the Fisher Body Division, General Motors Corp.

—o—

Dumas Steel Corp., Pittsburgh, an affiliate of M. G. Dumas & Sons, announces appointment of **Raymond W. Harris** as manager of sales. He formerly had been with the Tin Mill Products Sales Division, Jones & Laughlin Steel Corp., Pittsburgh.

—o—

David S. Miller, sales promotion manager, Building Materials Division, Armstrong Cork Co., Lancaster, Pa., has been elected president of the Producer Council, national organization of building products manufacturers. He succeeds **Tyler S. Rogers,** assistant to vice president, Owens-Corning Fiberglas Corp., Toledo, O.

—o—

E. G. Bailey, vice president, Babcock & Wilcox Co., New York, has been elected to be the next national president of the American Society of Mechanical Engineers. The position will be assumed at the end of the 1947 annual meeting, to be held Dec. 1-5. Mr. Bailey succeeds **Eugene W. O'Brien** of Atlanta.

—o—

The following have been elected members of the board of directors of the National Association of Metal Finishers Inc., Detroit: **Albert W. Olson,** Industrial Plating Works Inc., Seattle; **F. A. Truden,** Southern Finishers Inc., Nashville, Tenn.; **John Hilfinger,** Hilfinger Corp., Toledo, O.;

JOHN L. HUTTON

Appointed district manager, Philadelphia area, Clark Controller Co., Cleveland. Noted in STEEL, Oct. 6 issue, p. 92

D. J. Griffin, Birmingham Plating Works, Birmingham; and **Chas. W. Logan,** Logan Platers Inc., Tonawanda, N. Y.

—o—

S. F. Cole has been appointed district manager of the new office opened in Columbus, O., by the Youngstown Steel Products Co., representing the Youngstown Sheet & Tube Co., Youngstown. The Columbus office, which has been a suboffice under the Cleveland district office, is located in the Lincoin Tower. **R. J. Stamberger,** formerly with the Indianapolis sales office, has been transferred to Columbus as outside salesman.

—o—

J. Howard Blade has resigned as director of market research of the Glenn L. Martin Co., Middle River, Md., to form the Market Development Co. The new firm, with headquarters in Wellesley, Mass., offers "planned distribution" in the New England states, offering manufacturers seeking sales representation in this area the combined results of its market and product analysis with actual merchandising activities.

—o—

Electric Furnace Co., Salem, O., announces the opening of a new district office for Michigan, which will be located in the McKerchey Bldg., 2631 Woodward Ave., Detroit. **B. C. Thompson** has been appointed district manager, in charge of the office.

—o—

John E. Payne, formerly manager, industrial sales, Westinghouse Electric Corp., Pittsburgh, has been named manager of all industry sales departments for the corporation, with general overall responsibility for sales of equipment to all industries. **R. S. Kersh,** manager of the Houston, Tex., office, has been named manager of industrial sales to succeed Mr. Payne.

—o—

James D. Waser has been appointed manager of molded goods sales, Hewitt Rubber Division, Hewitt-Robins Inc., Buffalo, N. Y.

—o—

Charles J. Kolb has been appointed manager of industrial relations, Niagara Machine & Tool Works, Buffalo. He had been director of industrial relations with the Colonial Radio Corp., Buffalo.

—o—

William Hatton has been appointed director of manufacture of the International Telephone & Telegraph Corp., New York, and its manufacturing and sales affiliate, International Standard Electric Corp. In his new post, Mr. Hatton assumes, in addition to his present duties as director of engineering, full responsibility for the system-wide co-ordination and development of manufacturing methods. He has been associated with I. T. & T. and its affiliated companies since 1919, and is vice president and a director of the International Standard Electric Corp.

—o—

Charles Mahoney has been elected vice president and a director of the William H. Bingham Co. Inc., Chicago. Before joining the Bingham company Mr. Mahoney maintained his own consulting organization, known as Light Metals Engineering Service, which provided design, engineering and market counsel to metal and allied industries. During the war he was chief metallurgist and metallurgical superintendent of the Basic Magnesium Inc. plant, near Las Vegas, Nev.

—o—

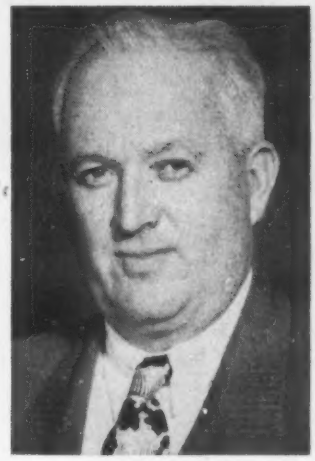
Wolverine Tube Division, Detroit, Calumet & Hecla Consolidated Copper Co., has announced that it will open a new warehouse this month at 1515 Fulton St., Houston, Tex. **L. G. Fox,** southwestern sales representative for the company, will supervise operation of the warehouse which will stock Wolverine seamless nonferrous tubing in the form of condenser tubes, S. P. S. pipe, copper water tube and refrigeration tube. It will serve the southwestern territory.

—o—

The Osborn Mfg. Co., Cleveland, announces the following changes in its sales organization in the Brush Division: **G. E. Mehleck,** sales representative and field engineer in the southeastern territory, has been transferred to the company's Chicago district

W. J. McARDLE
Appointed vice president and sales manager, Rigid-Tex Corp., Buffalo. Noted in STEEL, Oct. 6 issue, p. 94

BRIAN E. BRENNAN
Appointed chief industrial engineer, Bendix Home Appliances Inc., South Bend, Ind. Noted in STEEL, Oct. 6 issue, p. 94



JOHN H. KEATING
Elected vice president-manufacturing, Monarch Aluminum Mfg. Co., Cleveland. Noted in STEEL, Oct. 6 issue, p. 96

office. **Ralph H. Martin** has been assigned to Mr. Mehleck's former territory, which embraces Maryland, Virginia, North Carolina and South Carolina.

—o—

Jack Levand, for the past six years Ohio district manager for Luria Bros. & Co. Inc., Philadelphia, has been elected president of the Northern Ohio Chapter, Institute of Scrap Iron & Steel Inc. **Joseph B. Horwitz,** Joseph B. Horwitz Co., Cleveland, was elected first vice president; **I. B. Bennet,** I. A. Barnett Co., Barberton, O., second vice president; **Monnie Zipp,** Paramount Steel & Supply Co., Cleveland, secretary; and **Jack Oettiger,** Tyroler Iron & Steel Co., Cleveland, treasurer.

—o—

S&C Electric Co., formerly Schweitzer & Conrad Inc., Chicago, announces appointment of **H. A. Glover** as assistant sales manager. He has been sales department supervisor at S&C Electric.

—o—

Arthur G. Chase has been elected president and chairman of the board of the Precision Castings Co., Syracuse, N. Y. His election fills the vacancy caused by the death of **Fred P. Assmann.** Mr. Chase previously had been executive vice president and treasurer of the company.

OBITUARIES

W. Gibson Carey Jr., 51, president, Yale & Towne Mfg. Co., Stamford, Conn., was drowned while swimming in the surf at Ponte Vedra Beach, Fla., Oct. 4. Mr. Carey was chairman of the National Industrial Conference Board and a past president of the United States Chamber of Commerce. He became president of Yale & Towne in 1932, three years after entering the employ of the company as assistant to the president.

—o—

Henry N. Lutz, 62, secretary and a director of Edgcomb Steel Co., Philadelphia, died at his home in Haddon Heights, N. J., Oct. 4.

—o—

M. P. Heinze, 64, president, M. P. Heinze Machine Co. and Maxamite Corp., Chicago, died Oct. 3 in Park Ridge, Ill.

—o—

David B. McCoy, vice president and general sales manager, The Steel Co. of Canada Ltd., Montreal, died Oct. 5 at the Toronto General Hospital after several months' illness.

—o—

Edwin A. Baldwin, 73, former vice president of the International General Electric Co., Schenectady, N. Y., died Sept. 27 in Beau Montel, France. He had been in charge of the company's European affairs for more than 20 years, until his retirement in 1940.

—o—

Harrison W. Flickinger, vice president of Republic Aviation Corp., Farmingdale, L. I., N. Y., and a retired lieutenant colonel in the Army, died Oct. 5.

—o—

James Boyd, 42, assistant manager, American Co., Greenfield, Inc., died recently from injuries suffered in an automobile accident.

—o—

Calvin F. Duke, 83, founder of the Central Machine Works, Indianapolis, died recently. He had retired in 1942.

—o—

Hartley Green, 69, founder and president, Automotive Products Co., Detroit, died recently.

—o—

John H. Porter, 74, former steel executive, died at Lakeland, Fla., Sept. 29. He had been secretary, Inland Steel Co., Chicago, and also had been president of the Buffalo Steel Co. and the Calumet Steel Co.

—o—

William R. Stout, 88, former assistant treasurer, Foote-Pierson & Co. Inc., Newark, N. J., manufacturer of precision instruments, died recently at his home in Brooklyn, N. Y.

—o—

John M. Stetter, 80, superintendent, bolt & nut department, South San Francisco plant, Bethlehem Pacific Coast Steel Corp., San Francisco, died recently.

—o—

Charles E. Blue, 85, retired manufacturer, died Oct. 3 at his farm near Charlottesville, Va. For many years an inventor, designer, and manufacturer of industrial machinery, Mr. Blue founded and for years headed the Wheeling Mold & Foundry Co., and later the Penn Mold & Mfg. Co., Wheeling, W. Va.

—o—

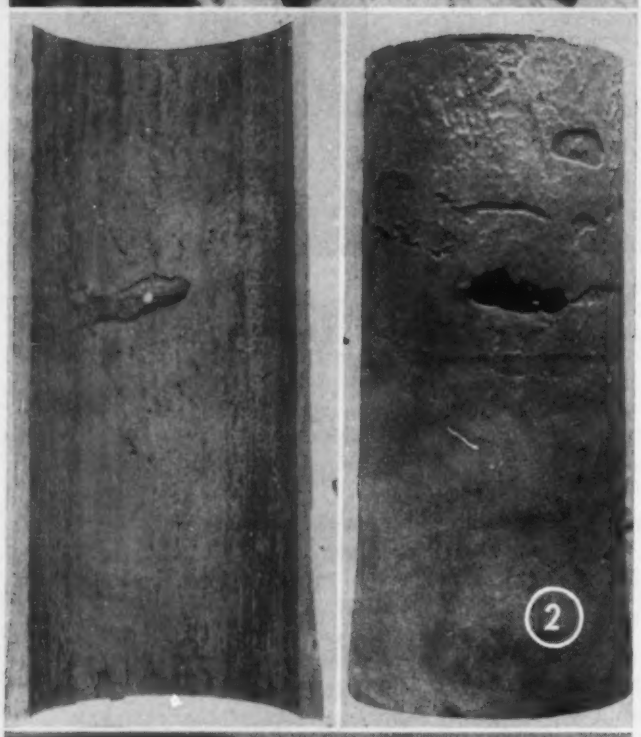
Paul A. Schoellkopf, 63, chairman of the board of the Buffalo Niagara Electric Corp., and president of the Niagara Falls Power Co., Niagara Falls, N. Y., died Sept. 30.

—o—

Frank G. Schaub, 43, treasurer, Calumet Steel Castings Corp., Hammond, Ind., and vice president, Z.V.S. Co., Chicago, died Sept. 30 in Chicago.

Effect of Carbide Structure on

CORROSION



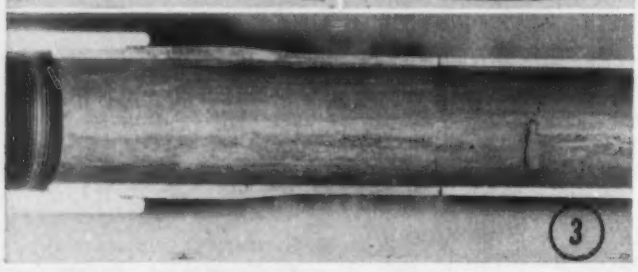


Fig. 1—Cross-section of corroded steel surface, showing edgewise penetration between cementite lamellae. 2000X picral etch

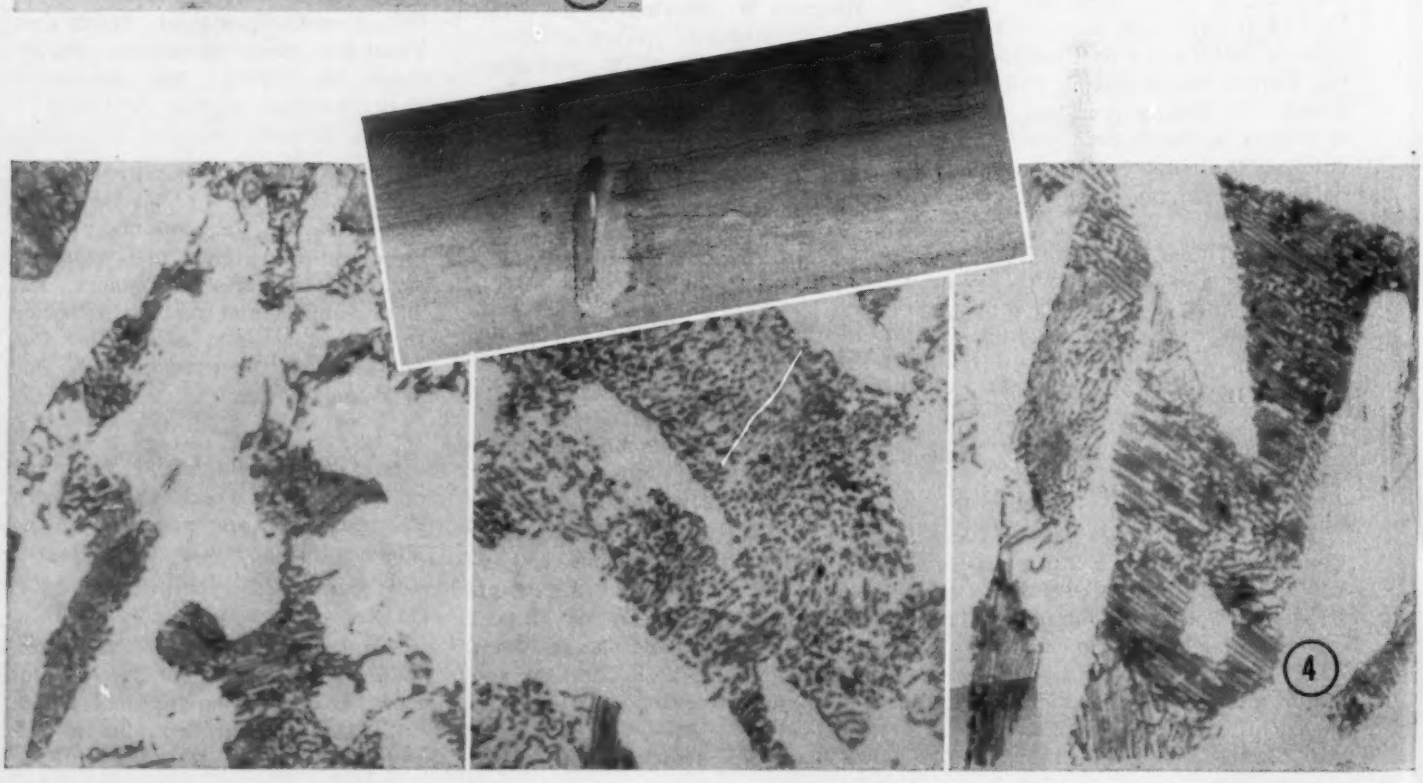
Fig. 2—Ringworm corrosion produced on inside of tubing in service (left) and on outside in laboratory (right). Originally, only indication of ringworm on outside was crack and small hole seen in reproduction at left

Fig. 3—Corrosion groove in ringworm zone of upset-end tubing. Failure occurred as a result of penetration of tubing wall

Fig. 4—Carbide structures associated with ringworm corrosion. Spheroidized carbides lie in zone indicated on cross-section of tubing wall. Original magnification of photomicrographs 2000X picral etch

Fig. 5—Unattacked cementite in a corrosion film on surface of steel (right) and original pearlite structure of steel (left). 2000X picral etch

Fig. 6—Unattacked cementite in a corrosion film (right) and original spheroidized carbide structure of steel (left). 2000X picral etch



By R. W. MANUEL
Engineering Department
Phillips Petroleum Co
Bartlesville, Okla

RESISTANCE of STEEL

Relationship between heat treatment or structure and ability of steel to retain protective films is demonstrated by the author. So-called "ringworm" attack on upset-end oil well tubing and other cases of oil well corrosion are discussed

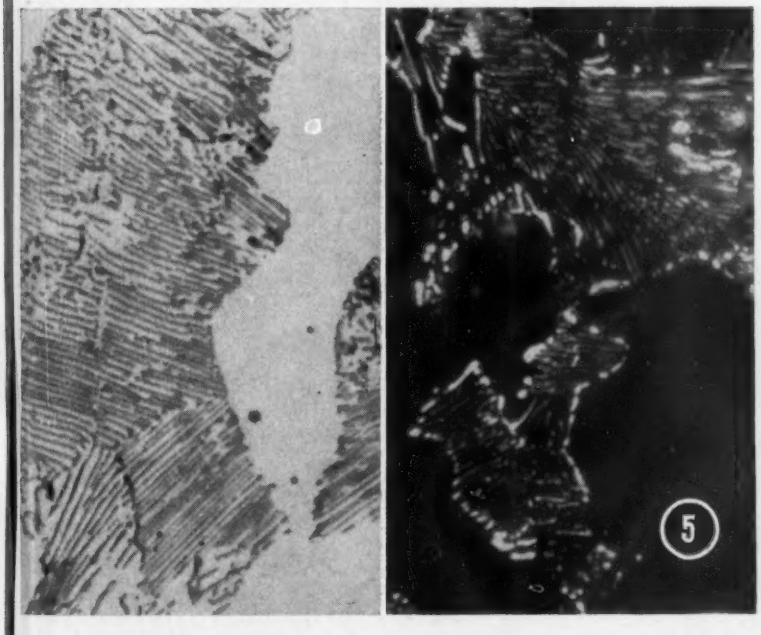
ALTHOUGH carbon steel is not generally regarded as a very corrosion-resistant material, there are a number of services in which it is attacked only slowly because of the protective nature of solid corrosion products formed on the surface. This fact is of great economic significance. It makes possible large-scale use of steel in handling such corrosive chemicals as concentrated sulphuric and hydrofluoric acids. It is probably of far greater importance in the life of steel oil-well equipment than has been generally recognized.

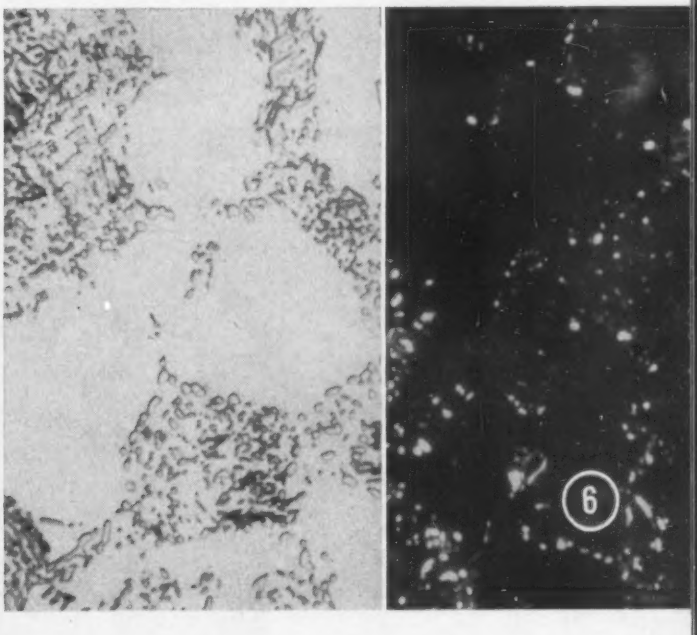
Corrosion products formed by the attack of oil-well fluids on steel are mostly insoluble. As a result, much of the surface is protected from further rapid attack, once a film of corrosion products has formed. On some parts and in some areas, however, this film either does not adhere, or is of too permeable a nature to stop diffusion of corrosive agents to the metal surface; and localized corrosion occurs.

Oil-well corrosion failures are usually the result of localized attack. Efforts expended in explaining various other factors involved in localized corrosion have somewhat obscured the significance of the fact that there is also involved a local failure of the natural protective film. External factors play their part, but the primary factor determining location and severity of corrosive attack on steel oil-well equipment is in many cases the inherent protectiveness or lack of protectiveness of the corrosion film as formed. The corrosion rate on poorly protected areas is often 10 to 100 times that on other areas. Obviously, great improvement in the life of equipment could be effected if a uniformly protective natural film could be obtained over the whole surface.

Past experience established the fact that metallurgical factors are often involved in oil-well corrosion. Holmberg[1] and Prange[2] stated that the presence of carbon in steel in the right form is generally beneficial to corrosion resistance under conditions which lead to formation of solid corrosion products on the surface. Medium carbon steels have been found to perform better than low carbon steels. Pearlitic steels perform better than steels with a microstructure in which the carbides are spheroidized by quenching and tempering. Further investigation now reveals evidence that the effect of carbide structure of steel on its corrosion resistance is even more significant than was previously realized. This effect is very critical, apparently because of a critical relation between carbide structure and protective properties of corrosion film formed on the steel.

One kind of corrosion in which the carbide structure





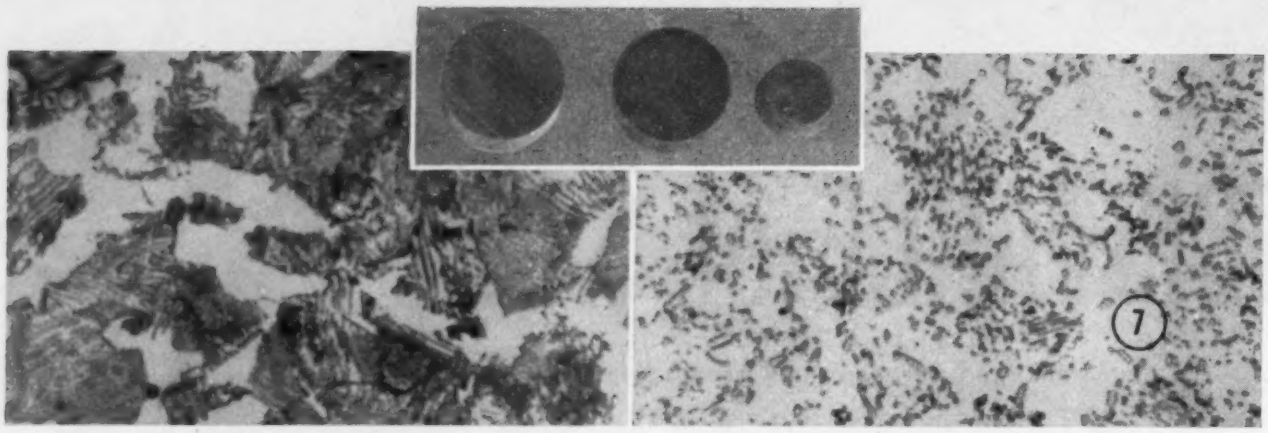


Fig. 7—Results of laboratory tests illustrating effects of carbide structure on corrosion rate. Unexposed sample, left (inset). Center sample had normalized pearlite structure shown below at left. Sample at right had spheroidized-carbide structure shown below, right. 2000X picral etch

has been found to have a critical effect not indicated by previous investigators is that of so-called "ringworm" attack on upset-end oil well tubing. This phenomenon is described by Wescott[3], Holmberg, Prange and others. It is a kind of localized attack occurring near the upset in tubing which is not normalized after forging. In the manufacture of such tubing, only the end is heated for forging of the upset. If the complete length of tubing is not subsequently normalized, a transition zone is left between the recrystallized metal of the heated end and the body of the tubing which was not heated to the critical transformation temperature range. There is a typical grain size change from relatively coarse to fine and back to coarse again in this zone.

Earlier investigators pointed out that severe local corrosion occurs in the area adjacent to the fine-grained zone. This was ascribed principally to the galvanic effect of the dissimilar metal structures in contact with each other. In 1945, after observing the ringworm corrosion in nonaqueous service, Prange proposed that localized corrosion was due to the lack of good pearlite in severely corroded areas.[4]

Microscopic examination of numerous specimens cut from corroded tubing now reveals that the critical factor determining the location and width of the severely corroded band of metal is the carbide structure. Invariably the ringworm occurs in the area where iron carbide, or cementite, is most extensively spheroidized. This area is adjacent to the fine-grained zone on the side away from the upset end. In this area the original pearlitic structure has not been completely destroyed by recrystallization, but the cementite lamellae have broken up into shorter, thicker lamellae and into spheroids. It has been found that the severely corroded band is (*Please turn to Page* 126)

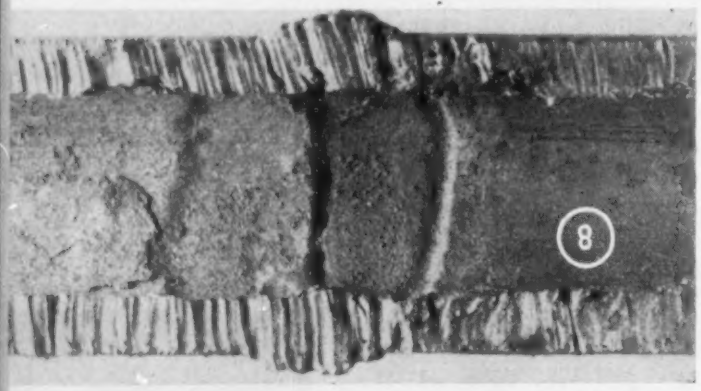
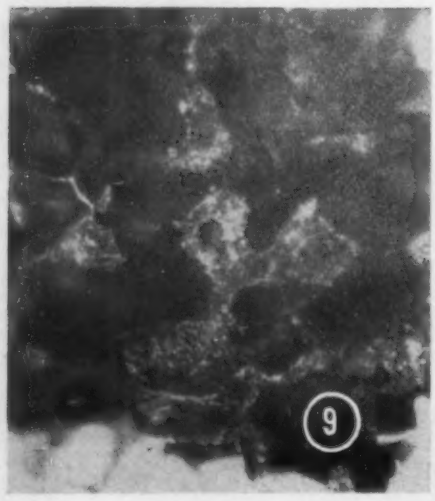
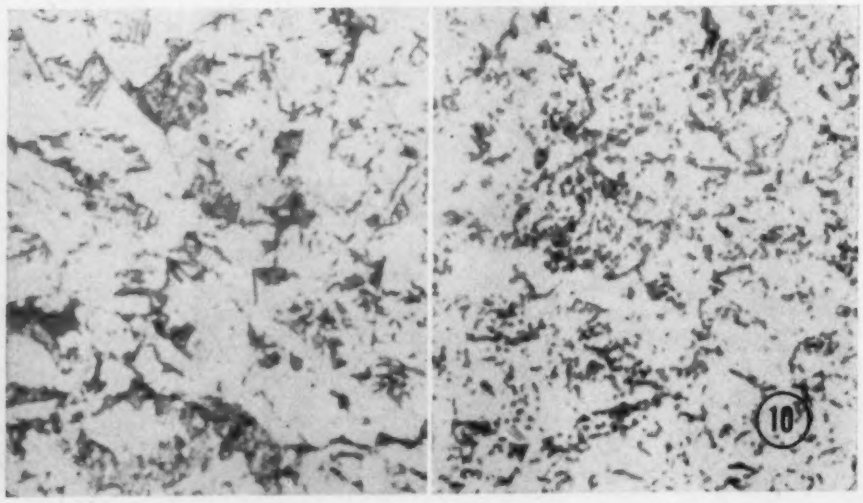


Fig. 8—Localized corrosion around weld in distillate well flow line

Fig. 9—Cross-section of surface at edges of locally corroded area. Pearlite in fine-grained metal and unattacked cementite in corrosion film. Cementite seems to form a fairly continuous network in corrosion product. 1500X picral etch

Fig. 10—Carbide structure of normalized N-80 oil well tubing (left) and spheroidized structure in ringworm corrosion (right). 2000X picral etch





NONMAGNETIC

Arc Welding Joints

Between Mild Steel Plates

By O. C. FREDERICK
Works Laboratory
General Electric Co.
Philadelphia

USE of nonmagnetic materials such as stainless steel, manganese steel, or copper alloys, is often required in the manufacture of switchgear and other electrical equipment to break up magnetic circuits. Welding of component parts made of these materials is frequently difficult and involved, requiring preheating and/or special electrodes.

Magnetic circuits have been successfully broken up by introducing an arc welded seam of nonmagnetic composition in a magnetic steel structure. By using this method where applicable it is possible to eliminate the need for special steels or nonferrous metals and to simplify welding of component parts.

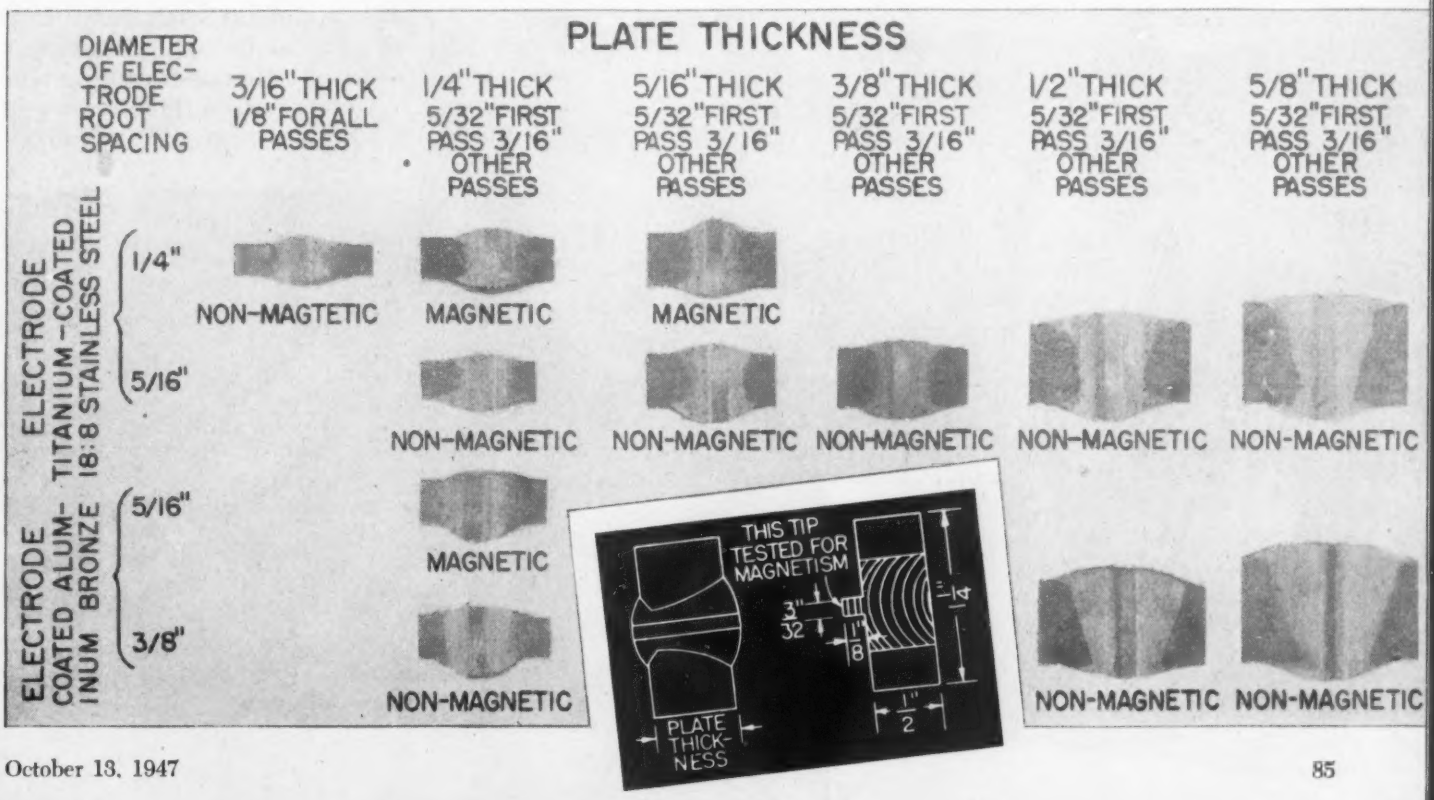
Accordingly, an investigation was undertaken to determine the minimum root spacing in groove design required for producing a nonmagnetic arc welded band between mild steel plates, when using stainless steel and aluminum bronze electrode filler metals. Results of the investigation indicate that thickness of plate material has no more direct bearing on groove width than for normal welding of mild steel groove welds. Type of electrode, diameter of electrode, welding current, and welding technique are the prime factors, as all four determine the amount of diffusion of the magnetic base metal into the nonmagnetic weld seam.

Accompanying illustration shows actual minimum root spacing required for various thickness of mild steel. It is recommended, however, that a minimum of 1/16-inch be added to the root spacings to allow for manufacturing variations. Mild steel used in the test had an analysis of: Carbon 0.2-0.26; manganese 0.35-0.80; phosphorus 0.06; sulphur 0.055.

All welds were groove type, the root spacing being held by inserting steel spacer blocks at each end of the groove and utilizing a copper backing bar. Plates were all clamped in place by C clamps. Welds were made with a minimum of penetration and weaving to minimize diffusion of (*Please turn to Page* 124)

Diameter	Type	Amperage	Current	
				Pol.
1/8 in.	Titanium-type coated 18-8 electrode	120	D-C Rev.	"
5/32 in.	" " "	140	A-C & D-C	"
7/32 in.	" " "	170	D-C	"
5/32 in.	Coated aluminum bronze electrode	140	D-C	"
7/32 in.	" "	170	D-C	"
5/32 in.	Coated phosphor bronze electrode	140	D-C	"

Tests made to determine minimum root spacing required to produce a nonmagnetic weld seam when filling a slot in mild steel plates with nonmagnetic arc weld filler metal



Press-Fit

. . . maintained in following production line techniques to turn out millions of oil seals

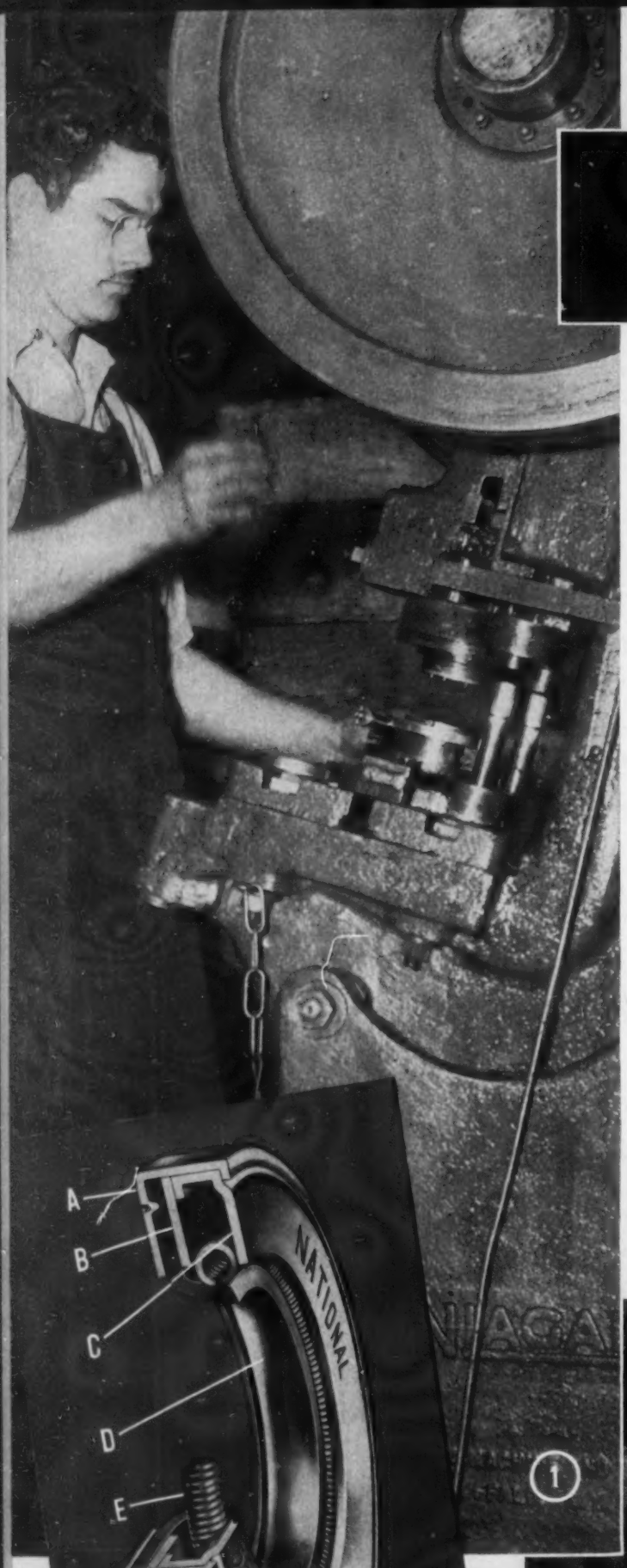
National Motor Bearing Corp., which today makes oil seals but no bearings, was founded Jan. 2, 1921, by President Lloyd A. Johnson when he and one helper set up a shop to rebabbitt bearings. His initial investment was $1200.

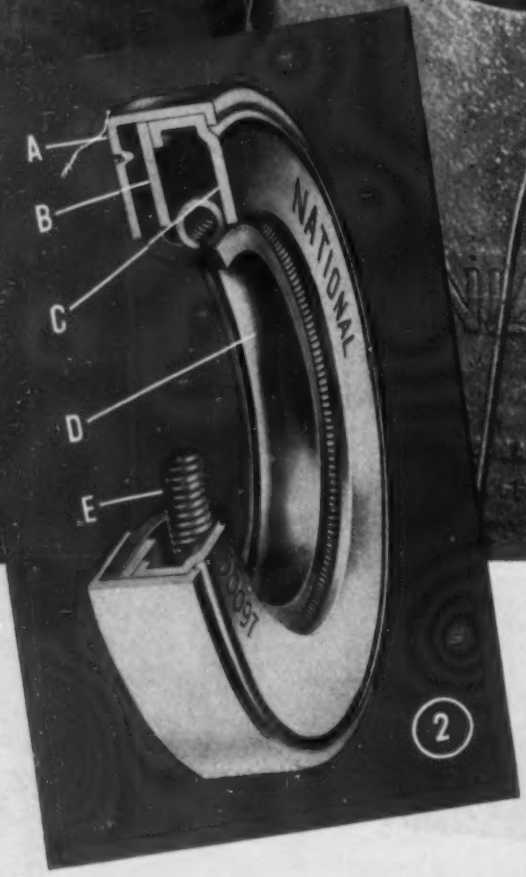
Next, he bought two punch presses for $1500 to make an improved type of laminated shim. Display cases were fitted out with 37 sizes of shims and sold to garages at $45 each. On a tour across the country in 1925, he tackled Chevrolet and landed his first large order.

The story then is told about the way Mr. Johnson got into the oil seal business about 1930, He cut apart a seal for a Model A Ford and decided it could be improved. Shortly thereafter, he bought the basic patents for a seal for $1700 and went into production. Today, the company has plants in Redwood City and Vernon, Calif., and Van Wert, O. Assets are placed at $4,500,000.

STRAIGHT-LINE production methods have been adopted by the National Motor Bearing Co., Redwood City, Calif., in producing millions of oil seals annually for use wherever wheels spin or shafts turn.

Japanese attack on Pearl Harbor found the company completing a transbay removal from Oakland, Calif. to a new one-floor plant at Redwood City laid out so there is a smooth flow of materials from the unloading dock at one end of the plant, on through various stages of production (*Please turn to Page* 116)





Tolerances

Fig. 1—Too-frequent die changes are reduced by close control over scheduling. Set of dies are shown being adjusted in a punch press

Fig. 2—New oil seal with impregnated leather sealing member. A—Outer case; B—control washer; C—inner case; D—sealing member; E—tensional spring.

Fig. 3—Steel sheets on arrival at National's Redwood City, Calif. plant are segregated according to thickness.

Fig. 4—Sheets are slit into widths varying with sizes of the seals being produced

Fig. 5—Blanking out oil seal components

Fig. 6—Seals are assembled by hand, then spun into a single unit

Fig. 7—Shown here is a corner of the die shop

Muffler Maker

Cuts Material and Manufacturing Costs

By Installing Equipment To Handle Coiled Strip

MACKENZIE Muffler Co. Inc., Youngstown, O., found it economical, both from the standpoint of original material and manufacturing costs to switch part of its steel requirements from hot and cold rolled sheets to strip purchased in coils. This was made possible by a setup whereby strip is automatically uncoiled, flattened and sheared to exact, predetermined lengths for muffler parts.

Besides turning out miscellaneous auto parts, and a line of toys, the company is one of the country's largest manufacturers of mufflers for sale as original equipment to builders of automobiles, tractors, trucks, etc., as well as for sale to the replacement market through distributors. In this competitive market, it is necessary to adopt as many manufacturing shortcuts and other economies as possible.

Until recently, MacKenzie purchased all of its steel requirements in the form of flat sheets which were sheared to required sizes for muffler components. With the new setup, a full coil can be cut up into blanks for muffler parts by loading it into the cradle of the feed and cut-off machine, eliminating much hand labor.

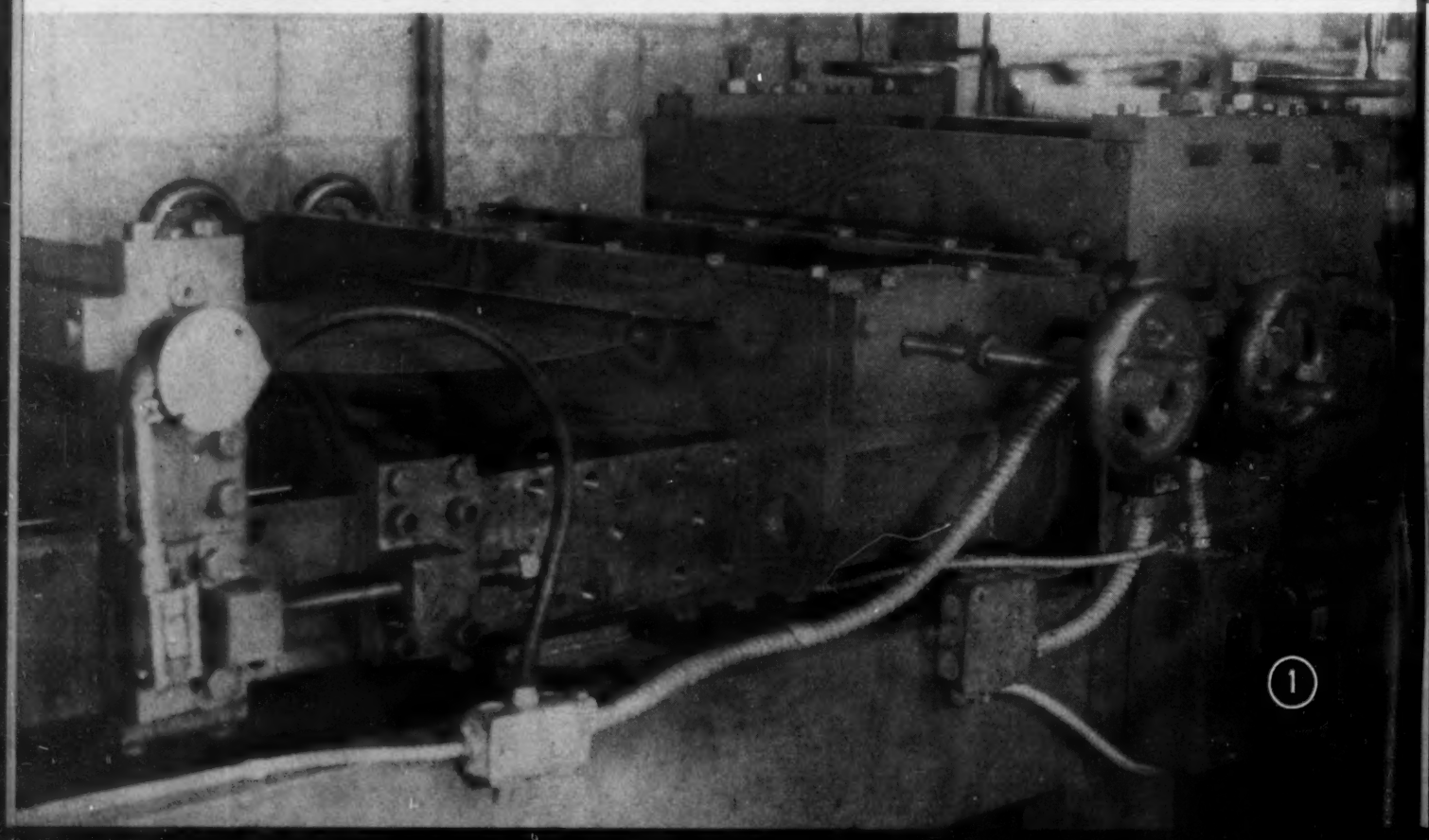
The machine was built by the Guide Co., Canfield, O., designer and builder of special steel mill and steel fabricating equipment. It is of welded-steel frame construction and has an over all length of 14 feet 8 inches, width of 71 7/8 inches and height of 46 3/16 inches. Pass line of strip moving through the machine is 37 inches above floor level. It will handle coils in any width up to 25 inches which may be cut into lengths up to 42 inches.

The coil feed machine just installed by MacKenzie consists essentially of the following units:

1—A box or cradle for holding the coils, which may be seen in the foreground in Fig. 3. Note the two rolls on which the coils rest. These rolls are mounted on 15-inch centers and may be power-driven in

Fig. 1—Close-up of machine in operation. Back clapper bar is at right; guide rolls in center and leveler and pinch rolls at right

Fig. 2—Hydraulically-operated stroking head in center grips strip and feeds predetermined length into shear in background. Clapper bars on either



handling heavy coils. Coils used by MacKenzie do not require a power drive. Side frames of the cradle may be adjusted to accommodate coils of varying widths.

2—A pair of pinch rolls to aid in threading the strip through the machine during setup. These rolls also may be power-driven, if required in handling heavier material. A removable hand crank is used by MacKenzie (see Fig. 1). Space between the rolls may be adjusted by a pair of hand wheels.

3—A set of leveler rolls consisting of two upper rolls and three lower rolls. These also are adjustable.

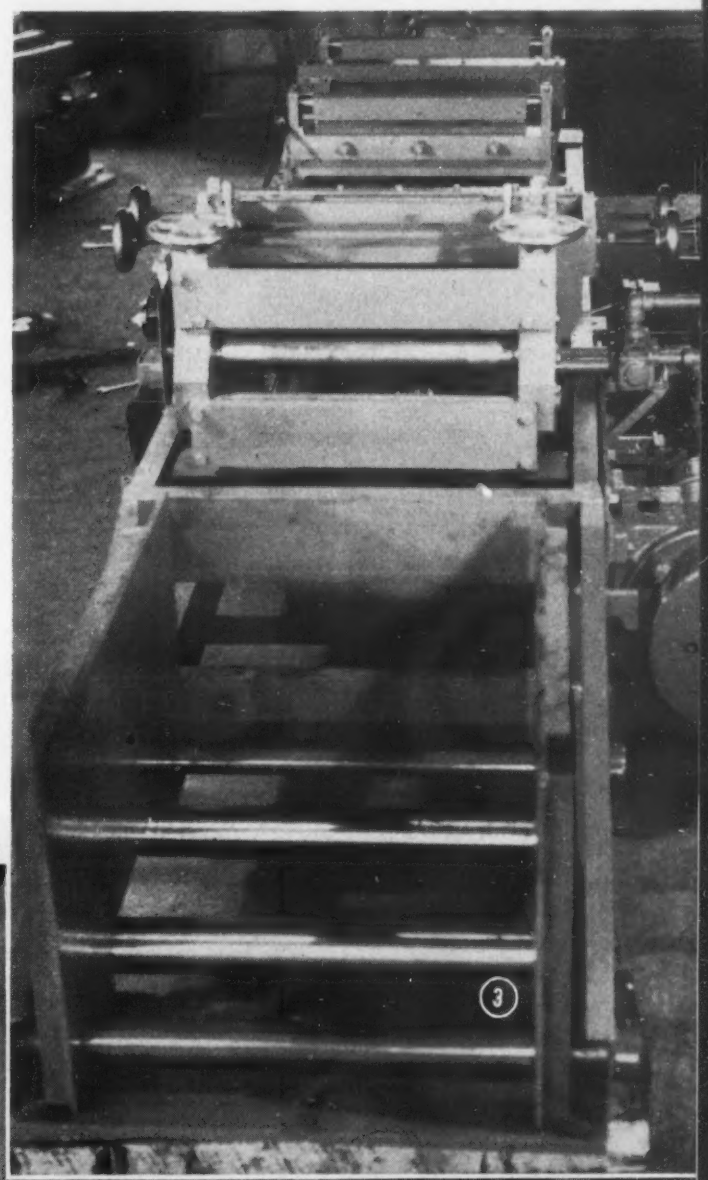
4—A pair of vertical guide rolls on either side of the machine to keep the strip centered as it passes through the machine. These have hand-wheel adjustments. See Fig. 1.

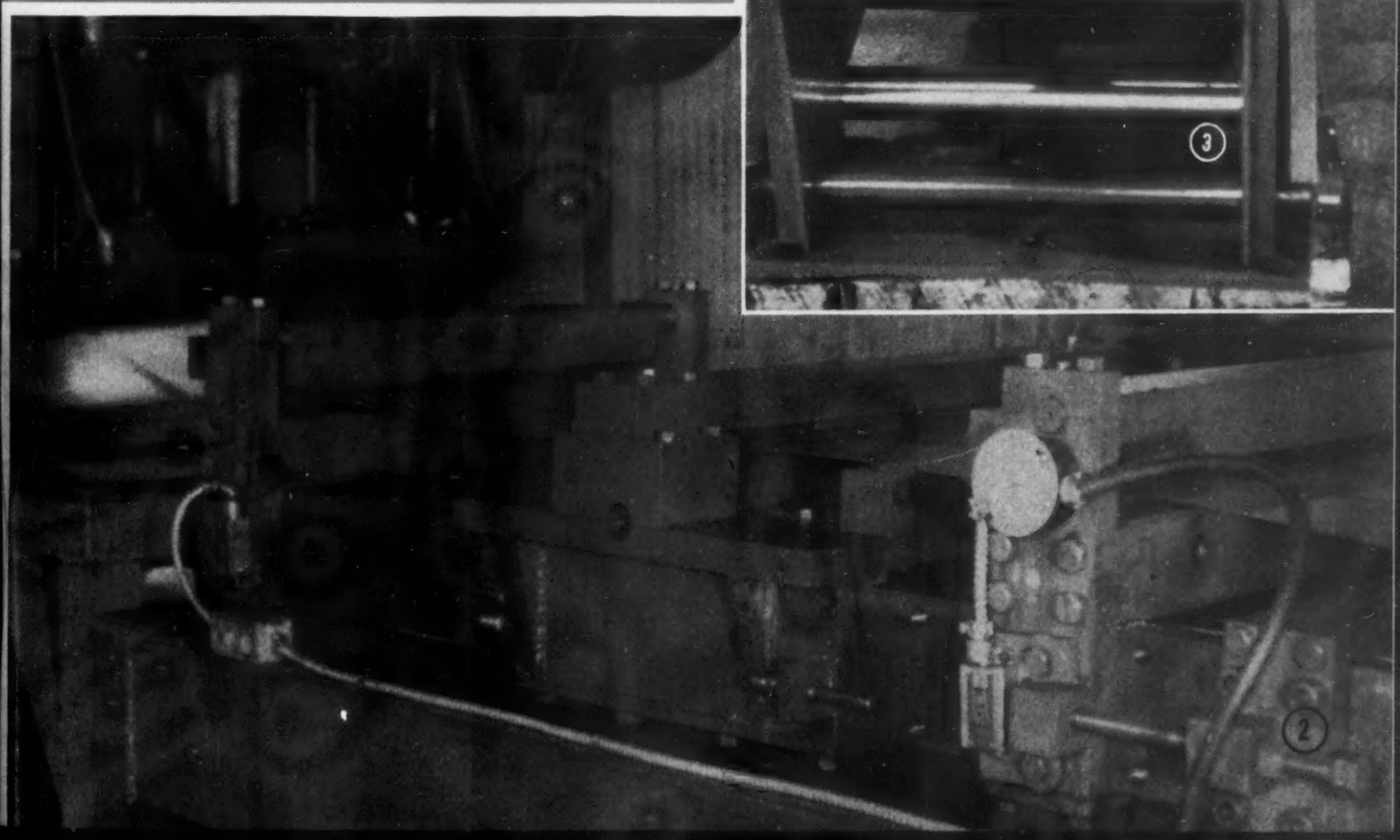
5—A moving, stroking head, hydraulically operated, which grips the strip when moving forward and releases it when reversed. This stroking head is designed so there is no distortion in the material or surface marks of any consequence. However, in handling highly polished sheets the head can be set so that the place gripped may be made to fall on the scrap pattern or on a shear cut.

6—A pair of clapper bars fore and aft of the stroking head to hold the strip while being cut off and during the return stroke of the head. Amount of movement of the stroking head, and thus the length of the section being cut off, is controlled by limit switches. Clapper bars with (*Please turn to Page* 114)

side of head hold strip while being cut off and during return stroke of head

Fig. 3—Coil feed and cut-off machine in process of being installed in the MacKenzie Muffler Co. plant in Youngstown, O. Coil box for holding steel strip is shown in foreground; hydraulic system at the right; pinch and leveler rolls in the center of photo





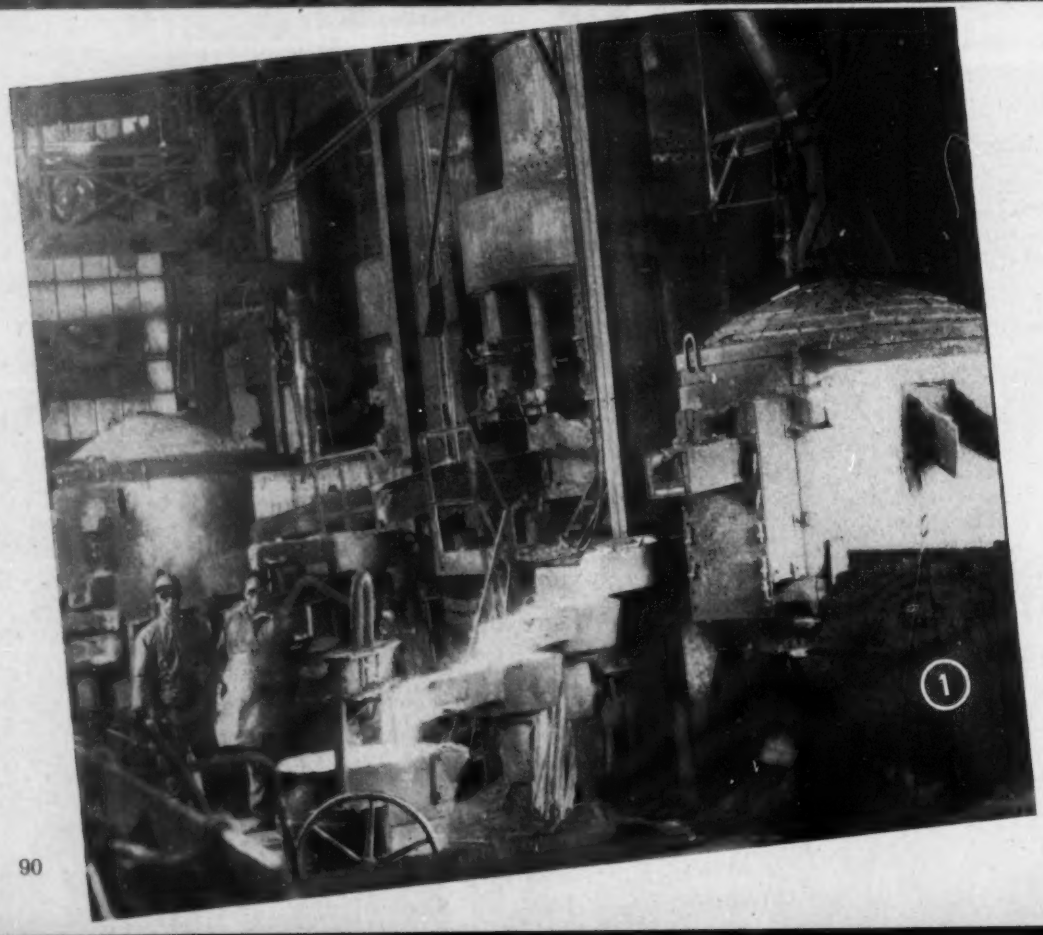
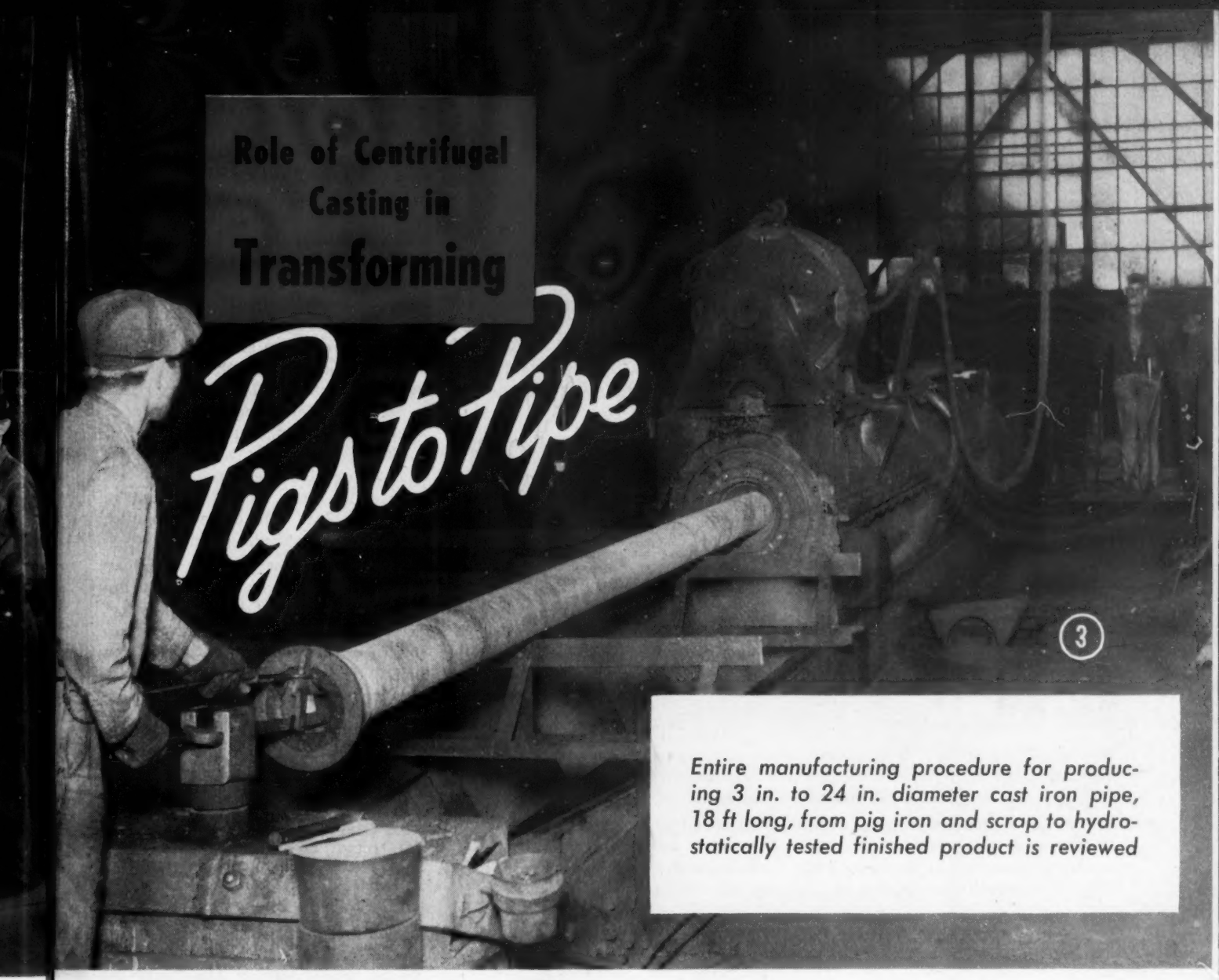


Fig. 1—View of melting department in front of three cupolas. Molten iron is cascading from cupolas through turn tables into transfer ladle

Fig. 2—DeLavaud casting machine on upward trip. Transfer ladle has just filled machine's tilting ladle which in turn will fill trough which conducts iron to interior of mold within machine

Fig. 3—Core setter has applied a clamp to inside of core of pipe still red hot. Machine is backing off pipe. Pipe is withdrawn from mold completing production cycle

Role of Centrifugal Casting in Transforming Pigs to Pipe



Entire manufacturing procedure for producing 3 in. to 24 in. diameter cast iron pipe, 18 ft long, from pig iron and scrap to hydrostatically tested finished product is reviewed

By GERALD ELDRIDGE STEDMAN

TECHNIQUE and flow in production of centrifugally cast iron pipe at the Birmingham plant of National Cast Iron Pipe Co., division of James B. Clow & Sons is of considerable interest during this present period of critical pipe shortage. Relative favorable position of cast iron as a construction material is well established because of its permanence as a conveyance for water, gas, steam or chemicals.

Products of corrosion of cast iron tending to revert to the iron ore from which it came and which had existed in the ground for ages, form a tough protective coating in themselves which arrest further corrosion. Oldest known installation in 1664 at Versailles, France, is still in service. Earliest installation in the United States at Philadelphia in 1804 is still in successful operation.

Production at the Birmingham plant is in 3 to 24 in. diameter pipe, 18 ft long. The old method was to cast these on end in sand lined molds into which the pattern was rammed, the same as in any sand molding. A pipe core was set in, built up with hay rope and clay on a steel shell to enable it to be pulled easily. The pour was vertical. Half-shells of the full diameter of the mold were hinged. The method, after pour, was to pull the core, loosen mold hinges and pull out the pipe. It required about 18 hours for this molding and curing process, while by the new centrifugally cast method, forty 18-ft lengths per hour are possible.

The old method had many disadvantages, such as thick walls, low tests, excessive porosity hazards. The de Lavaud centrifugally cast method used by Clow-National, controlling surface chill, develops better surface structure, finer grains, lighter weight, thinner walls, better tensile properties, no porosity, great ductility, better flowability, smoother outside surface, less corrosive activity.

Selection of pipe for underground mains tends to rest technically upon 10 factors in relation to longevity, internal pressure, tensile strength, toughness, beam load, external pressure, imperviousness, tight joints, tapping facility, flow capacity. Routine specimens of 6-in., 150-lb water pressure class Clow-National pipe indicate that under hydrostatic pressure, it will withstand more than 2500 psi. Tensile strength ranges 25,000 to 30,000 psi. Under 50 lb hydrostatic, when shocked with a 50-lb drop hammer blow, starting at 2 in. and increased 2 in. in drop height after each blow, impact resistance is sustained at 36 in.

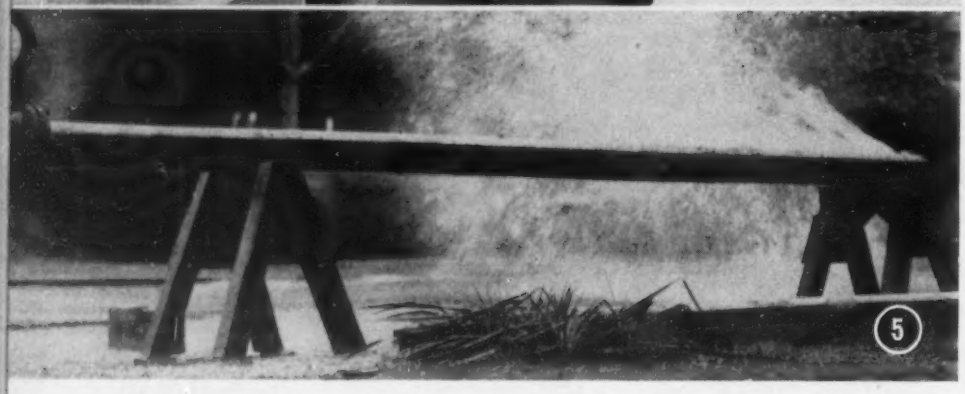


Fig. 4—Eighteen-foot pipe leaving annealing furnace. Here speed of travel is governed by sprockets attached to conveyor chain which travels full length of furnace

Fig. 5—At regular intervals a bursting test is applied to standard pipe. Pipe is regularly tested at six times its normal working pressure but excess pressure up to thirty or forty times normal working pressure is sometimes applied to determine ultimate strength

Under beam stress tests, at 18,000 lb load, deflection approximates 1-3/4-in. in. before fracture. On 12 in. sections, pipe withstands crushing weight of 15,000 lb.

The 22-acre Birmingham plant is serviced by four 5000-ft L & N Railroad sidings. Pig iron and scrap enter the 60 x 160 ft melting area directly, one siding being under roof. Pig and scrap storage is by this trackside. Pigs weigh 50 lb each. Loading is by magnet with 2500-lb lift capacity.

In these days of controlled pig iron supply and shortage of scrap, the company is attempting to melt everything that can be procured in the way of metal. In some of the scrap received, large pieces weighing as much as 1500 to 2000 lb are not uncommon. The plant devised a plan of preheating these large pieces in an old sandcast ladle tipped on its side. The fuel is gas. In this peculiar furnace, when chunks reach cherry-red condition, they are transferred by crane to the charging floor where they are dropped into the cupolas. So far the idea has met with success. Several of the unbreakable chunks have been converted into deLavaud pipe or fittings.

Cupolas are served by a 5-ton overhead crane with 60 ft span. Charge runs 20 per cent scrap, 80 per cent pig. There are three cupolas, each having capacity of 25 tons per hour. They are relined each year. Two alternate in one day run each, the third is standby spare. Idle days are used for patch up around melting zones. The cupolas are serviced by a 100 hp, 20 in. Sturtevant blower, using 16 oz pressure.

By magnet hoist, pig and scrap come to the 21-ft high charging floor and the tracked charging car. Coke and lime bins are by track side on this platform. After making up the charge, cars move direct to cupola and are tripped by cable. The hot metal from the cupola comes to a forehearth, designed to effect uniformity by mixing itself while awaiting pour. This hearth has a clay-lined trough with a swinging spout which transfers the hot metal to 3½-ton transfer ladles positioned for the pour by a 5-ton overhead crane with 45 ft span. This is the starting action in the 170 x 190 ft deLavaud centrifugal casting building, having three bays. Pour from the cupola ladle is at 2400° F.

By the deLavaud system, pipe is cast in a cylindrical metal mold which is rotated horizontally while the molten metal is fed into it at a uniform rate of flow. The centrifugal casting machines are lined up in parallel battery formation in the main bay of the deLavaud building, each capable of casting a certain diameter pipe. They are at a slight pitch. Each is accommodated by a circular backed ladle, designed to control the precise amount of metal required for each pour. The machines have a fixed bed 40 ft long with a puller block at its end. Along this the machine travels on a 39-in. track. It is facilitated by 35 hp motor. Machine stroke is powered by hydraulic cylinder.

Mold sits in a water box on rollers and is water cooled. At pouring speed, it revolves at 1200 surface feet per minute. Each machine has an 18-ft steel pouring trough with cast iron liners, its diameters varying in size to agree with the pipe diameters being cast. Hot metal travels down the trough from the machine ladle. Molder at his pulpit controls machine stroke by hydraulic cylinder. A core setter is stationed at the back of the machine. Machine travels up so that the trough is positioned at the bell end of the mold to start the pouring stroke. It moves down until the pour has been effected. Trough is stationary. Pouring speed of the machine is approximately 1 fps. In the backstroke when pulling the pipe, the machine speed is 2 fps.

In pouring, rotary force throws metal against side of mold forming pipe. Centrifugal force eliminates from the metal all impurities and forms a homogeneous structure. In casting this pipe centrifugally, the only core is in the bell. This is a sand mold that can be quickly knocked out.

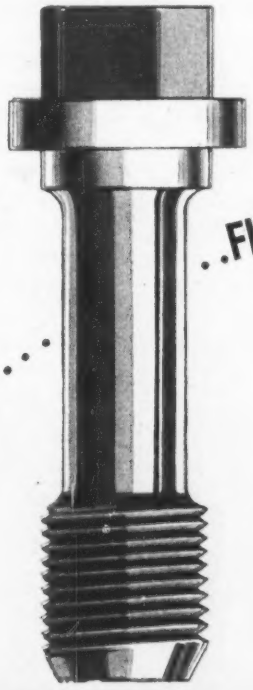
Trough of the machine is cleaned after each pipe is cast. Slivers are removed from the trough and liners are again blackened. Each trough carries a dusting tube which sprays the mold with a ferro-silicon compound immediately before the iron is poured in the revolving mold. This insulates the mold from the hot metal and eliminates all surface chill in the pipe. Capacities of these deLavaud machines vary. For example, capacity of 12-in. diameter is 25 per hour; for 4-in. size it is 40 per hour. Mold life varies between 1000 and 5000 pipes. Mold repair is discussed later.

Sequence of operations in centrifu-

THE GOOD OLD DAYS?

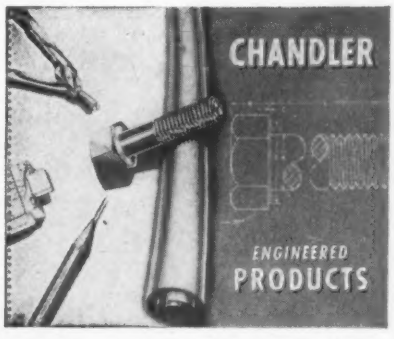
we're glad they're gone

Toward the middle of the last century many ingenious heading machines were devised to make bolts. While each one contributed something to the development of the bolt making industry, today the failures are nothing more than museum pieces. No, the good old days were long on pioneering, but TODAY is when that pioneering pays off. We are glad we are living in an age when quality and workmanship can be controlled on the production line. We like modern machines, modern workers, modern methods—and our cold wrought engineered products are as modern as tomorrow. The good old days? No, thanks. We are strictly an up-to-date organization, and that's the way we intend to remain.



THE CHANDLER PURPOSE....

..FINE COLD WROUGHT PRODUCTS



CHANDLER PRODUCTS CORP.

1491 CHARDON RD. CLEVELAND 17, OHIO

gally cast pipe by this method starts with setting of sand mold head core in bell. Machine travels up at high speed over the trough. Machine ladle is automatically tilted to start the pour, hot metal traveling by chute into the trough. The core setter at the machine rear signals the operator at the pulpit when the bell is filled. There is an art here. Judgment is by color and timing is split-second to prevent collapse.

As the bell is poured, machine travels down track until the pipe is completely laid. Core setter then knocks out core locks and inserts an expanding pipe puller. The machine back strokes and pipe is thus pulled. Swing roller skids, actuated by counterbalanced weight, automatically swing into place under the pipe which rolls on skids to permanent skids at machine side. These swing skids are repositioned by machine stroke, automatically. Core itself is knocked out of the pipe on permanent skids. Cast pipe is then transferred in cherry red condition to scales by overhead crane accommodated by a 9-ft cradle hook.

Directly from scales, which are really a feature of the furnace hearth, pipe starts its travel through a normalizing furnace to relieve all strains and any chill that it may have received in transfer. This is a continuous, gas-fired, automatically controlled 12 burner furnace, six burners per side. It has 22 x 56 ft inside dimensions, with a 28 ft hot zone, 22 ft cooling zone. Cycle, depending on pipe size, averages 70 min.

Furnace is equipped with Carbofrax rails set at slight uptilt and perfectly in line. Pipe travel is by a finger conveyor equipped with teeth spaced 15 in. traveling at 55 to 75 spaces per hour. Furnace temperature is 1750° F. This normalizing furnace is set up with manually controlled oil standby, firing at 1750° F. Controls are Leeds and Northrup and Bristol.

Emerging from the normalizing furnace, pipe rolls on a five-rail cooling track past a suspended automatic counter and receives 100 ft of air cooling in its travel to the reaming stations. Here a battery of two rotary reamers with a 20-ft bed travel (reamer cars traveling by cable feed, powered by 5 hp motor and burring at 1200 rpm) are set to run into the pipe 18 ft. Pipe then travels by the same rail conveyor to grinding stations where inside of pipe back of the bell and rough back left by the core are ground in. The pipe then arrives at sorting crane traveling above conveyor bed on monorail. Here from five to ten pieces of each pipe size are grouped to make ready for tar dip.

Pipe, traveling on the five-rail conveyor, arrives at the 8 x 22 x 16 ft deep tar dip with incline drain. It is still hot enough for efficient coating. Temperatures here are from 175 to 250° F; the lower the temperature, the longer the tar life.

Work then passes to the hydrostatic testing station where each individual pipe is head clamped, filled with water, given a 600-lb hydrostatic test and a simultaneous impact test by hammer. At this point, pipe has travelled 216 ft from normalizing furnace to final inspection area at end of conveyor line. About 1000 pipe of all sizes pass final inspection each day; they are weighed, marked, hardness tested (brinell 95).

Cast iron pipe is subject to the phenomenon of tuberculation with certain types of waters in certain parts of the country. These waters contain iron absorbing bacteria which become insoluble, attaching themselves to the bare iron and begin the formation of tubercles. To these skeletons, others attach themselves so that the tubercle of ironized skeletons eventually materially restricts flowability. One of the preventions for tuberculation is to cement-line the pipe; Clow-National maintains a department for this purpose.

Trowel-type traveling head mounted on a 20-ft hollow auger supported by steady rest is the device used for 1/16 to 1/8-in. cement lining applied smoothly to prevent this tuberculation. Auger conveys cement from a hopper mounted on the carriage to the trowel head, carriage moving on rail track with stops provided by moving trolley. The auger with trowel head travels through the pipe. Pipe turns at approximately 900 fpm, travel speed controlling the thickness of the lining. About 40 per cent of Clow-National pipe is thus cement lined.

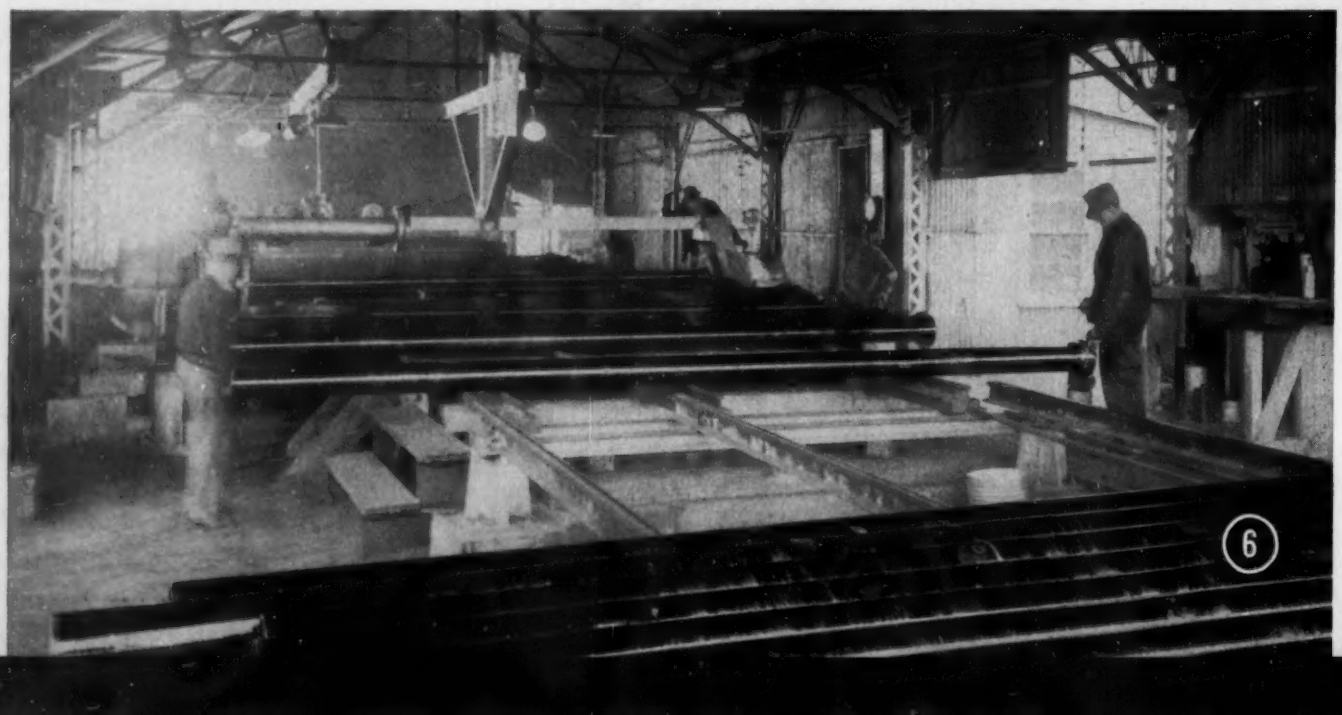
Pipe then passes to a 24-hour cure in a 40 x 125-ft curing shed. It is then sprayed with an asphalt emulsified paint if the customer specifies. A long spray gun moves on roller track and is injected into the pipe for this painting.

A large shedded area in the storage compound is given over to flange shop activities. This is equipped with large engine lathes, special mills, unusually rigged threaders for flange installations. These come to the shop drilled; they require facing, bolting and tightening so securely that they can not readily be taken off.

There is a complex variety of elbows, tees, crosses, laterals, reducers and other types of flanged fittings for water and steam, together with a great many special cast iron fittings and irregular shapes up to 14,000 lb to accommodate unusual requirements in such constructions as waterworks,

(*Please turn to Page* 122)

Fig. 6—End of pipe finishing run with hydrostatic test press in background. Final inspection and weighing section is in background



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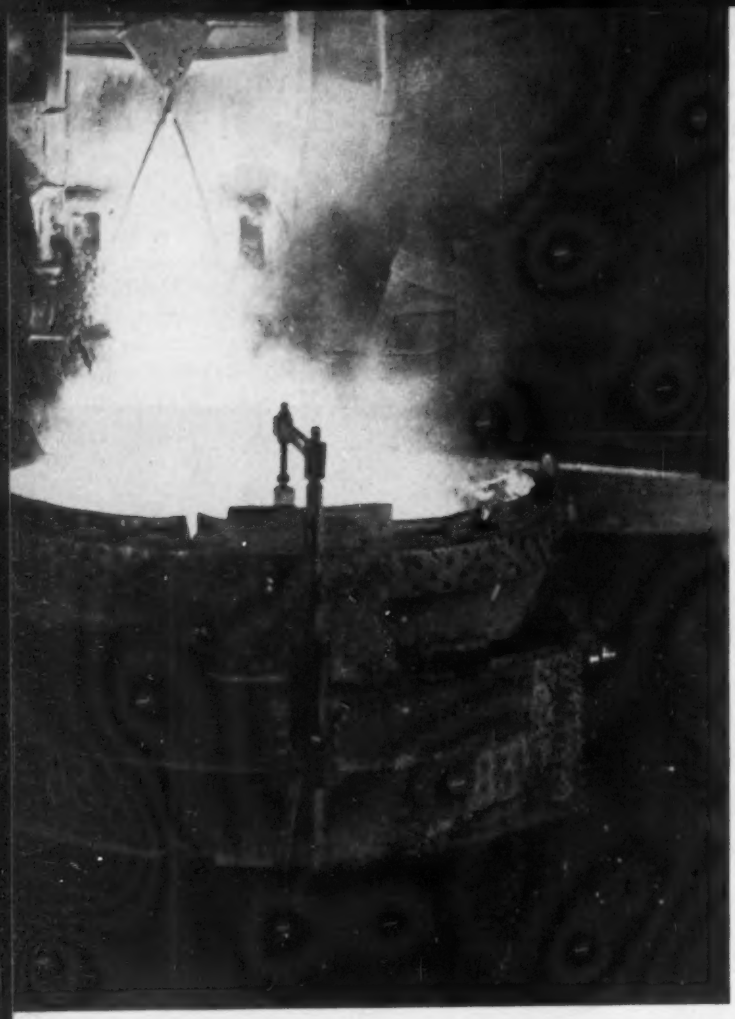


Tapping a heat of basic open-hearth steel made under oxygen practice

Engineers Evaluate Use of

OXYGEN ENRICHED AIR

Open-hearth operators stress need for better means of introducing oxygen and longer life of roof refractories. Conversion of blast furnace for high top pressure operation exclusive of blowing equipment is set at nominal sum. Digest of operating data brought out by various papers is presented

TWO definite advantages of using oxygen in the manufacture of open-hearth steel were cited by steelmakers at the annual meeting of the Association of Iron and Steel Engineers, William Penn Hotel, Pittsburgh, Sept. 22-25, namely, speed with which high-carbon meltdowns are recarburized, and the salvage of off-grade heats.

Highlights of the 4-day meeting were presented in the Sept. 29 issue of STEEL, p. 50. All sessions of this year's meeting were well attended but that at which oxygen was discussed overflowed into two hallways. A feature of the latter session was the moving pictures in color made by The Linde Air Products Co. showing the ebullition of molten steel while being lanced with oxygen as well as many other phases of the heat in the process of manufacture. Appreciation of the picture which was taken under extremely difficult conditions was acclaimed by prolonged applause.

Resume of the papers dealing with the application of oxygen to steelmaking, a progress report on the high top pressure blast furnace at Cleveland, conditioning of stainless steel, lifting magnetic design, soaking pit operation, and other subjects are as follows:

Use of Oxygen in the Open Hearth, by E. C. McDonald, chief combustion engineer, Republic Steel Corp., Cleveland: A permanent 8-inch line, 1000 feet long, was installed between a Driox Plant and two open-hearth furnaces at the Cleveland Works. Piping facilities of the two 200-ton furnaces provided the use of oxygen directly in the furnace, through the checkers by being introduced into the air fan discharge, and for carbon reduction with a lance. Use of oxygen enriched air through the checkers was abandoned early in the experiments because the benefits were not clearly perceptible. Oxygen consumption has ranged between 850 and 1300 cubic feet per ton and over a series of 770 heats averaged about equally between burner use and lances.

A 1-inch standard pipe, 20 feet long, has been the size used for lancing. Six to ten lances were used per heat with an average life of 18 minutes. Total time per heat the lances were in the furnaces averaged 2 hours with a range from 1½ to 3 hours.

Splashing and iron oxide penetration caused by lance injection seriously impaired the furnace roof and backwalls. Refractory experience was so bad on a furnace with a 5-foot roof that the design was changed to 8 feet from sill plate to skewbacks. Uptakes were increased from 6 x 4½ to 6½ x 9¾ and monkeywalls eliminated. Backwall cooling was added to improve the life of the high backwalls.

Experimenting was done with two ¾-inch pipe instead of the 1-inch lance but the splash was not reduced enough to warrant inconvenience from charging floor traffic. A satisfactory method of introducing oxygen into the bath constitutes the No. 1 problem at the moment.

Rate of oxygen flow through burners has been 30,000 to 40,000 cubic feet per hour which permitted an increase in the fuel rate while melting down by 15 million Btu per hour to a maximum of 95 million Btu per hour.

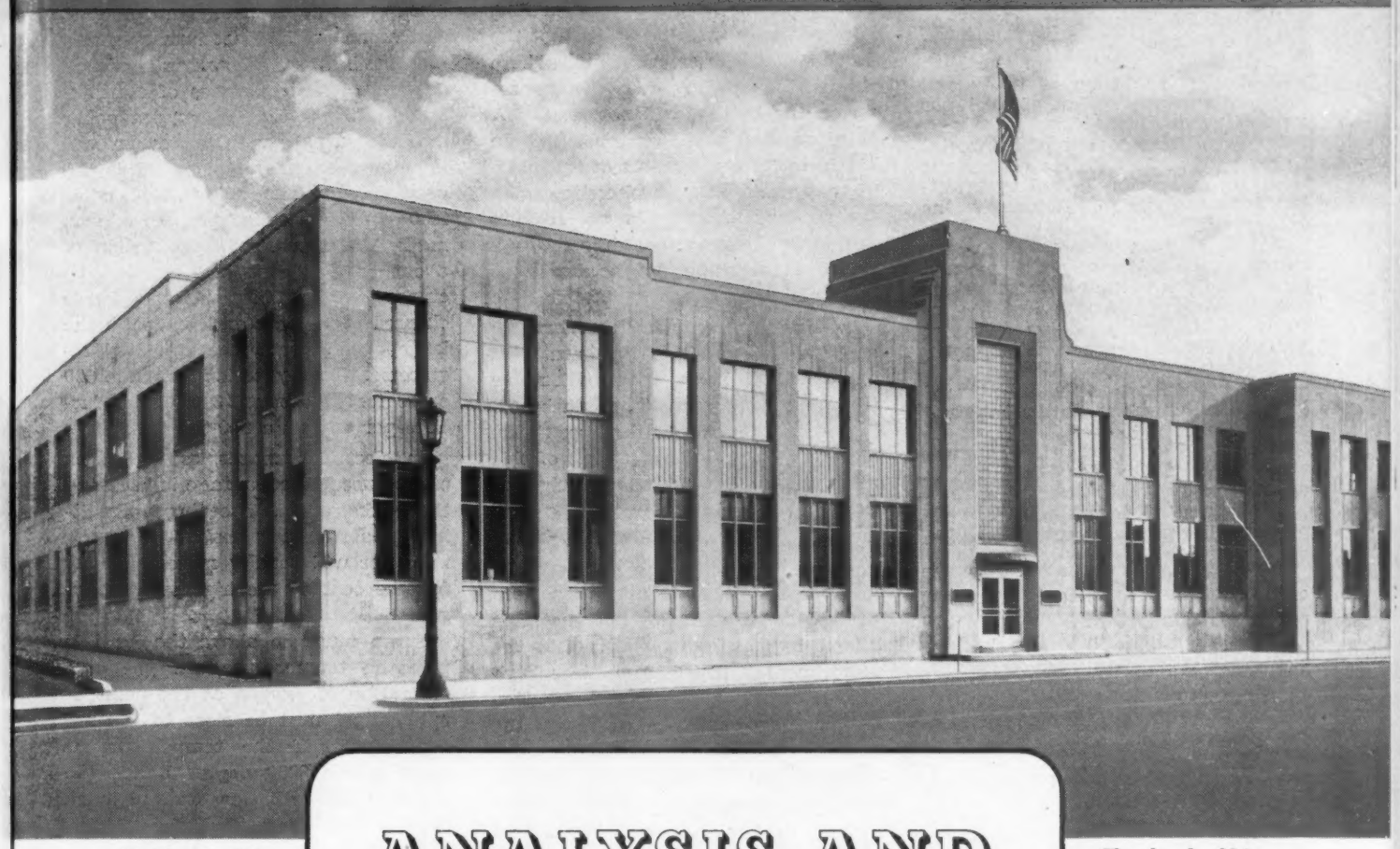
Use of lance oxygen usually was started after the first flush but when conditions were favorable it was started directly after the addition of hot metal. The normal rate for lancing use was 50,000 cubic feet per hour though twice this amount has been used by employing two lances.

Oxygen used on these two open hearths increased production per hour up to 90 per cent and reduced fuel consumption 50 per cent under regular practice. Downtime on the oxygen furnaces averaged 42 per cent more than on other furnaces and this combined with the time penalty of additional warm up periods on the oxygen furnaces resulted in considerable loss in tonnage.

No difference has yet been detected on the quality, surface and yield of oxygen heats as compared with regular practice.

During the nine months of opera-

NUMBER 10 IN A SERIES OUTLINING McKEE SERVICES TO THE IRON AND STEEL INDUSTRY IN RECENT YEARS



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ANALYSIS AND CONSULTATION

THE large number and variety of conditions affecting the operations of an iron and steel plant make it almost impossible to obtain the most satisfactory results by duplication or standardization of plant designs. Alterations and additions to old plants and particularly the construction of new plants should, therefore, be preceded by an analysis of such conditions, and designs and equipment should be adapted to their requisites.

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tion on oxygen certain conclusions have been reached as follows:

1. Use of oxygen in the open hearth to enrich air for combustion and eliminate carbon from the bath will shorten the time of heats and reduce the consumption of fuel per unit of production.
2. When using a ratio of hot metal to scrap of 80:20 the greatest benefit of using oxygen is derived by injecting into the bath to eliminate the carbon.
3. Use of burner injected oxygen increases the luminosity of flame and promotes quicker meltdowns of scrap.
4. Use of oxygen enriched air introduced through checkers does not produce flame characteristics equal to burner injection.
5. A better means must be found to introduce oxygen into the bath and attain longer roof life.
6. Discharge of dust from the stack while using the oxygen lance can be eliminated by water scrubbing.
7. Oxygen of lower purity could perhaps be used advantageously.

The following benefits from the use of oxygen in open-hearth furnaces may be obtained:

1. On improved furnace designs.
2. Total or partial elimination of checkers.
3. Higher overall furnace efficiency.

Uses of Oxygen in Steel Production, by J. H. Zimmerman, manager, Development Division, Linde Air Products Co., New York: By using oxygen in conjunction with end burners, it is possible to increase the fuel rate and at the same time to shorten the flame to such an extent that it will not go into the downtakes. By firing oxygen under the fuel jet an area of higher flame temperature and greater radiation are obtained on the bottom side of the flame, while the top side of the flame which radiates to the roof is practically identical with normal firing conditions. With end burners of this type decrease in charge to tap time has averaged 10 to 25 per cent with a range of 400 to 750 cubic feet of oxygen used per ton of steel. End burners are particularly valuable where relatively high percentages of cold metals are charged.

Another method for meltdown of the scrap charge involves the use of a supersonic velocity oxygen stream to oxidize a small portion of the preheated scrap in much the same manner that a piece of carbon steel is cut with the oxygen jet. This oxidation, being an exothermic reaction, provides sufficient heat to melt adjacent scrap. The oxygen stream is introduced into the furnace by a water-cooled device having a divergent bore nozzle which imparts the high velocity. Rapid meltdown is obtained by this method with oxygen consumptions in the order of 22 to 36 cubic feet per ton. In using this method, however, care must be taken that the furnace and the scrap are at a high enough temperature so that a freeze-up on the bottom will not result. A third method also being used as an aid in meltdown consists of introducing oxygen into the checkers to enrich the air blast to the furnace. Results are inconclusive although somewhat improved working of the heat has been claimed.

Auxiliary oxygen-fuel burners for scrap meltdown also have been tried on a limited basis, with indications that promising reductions can be effected in the charge melting times. However, further development of this method will depend upon design of practical means for mounting and mechanizing burners for roof, backwall, or frontwall operation.

After the scrap charge has been melted down and the hot metal is added, oxygen again comes into the experimental picture for decarburization of the melt. Decarburization is being accomplished either by the use of consumable lance pipe or a nonconsumable water-cooled jet device. The consumable lance is introduced into the melt with the end of the lance at the slag-metal interface. A slightly different technique is used with the jet device. In this case, the jet device is held 3 to 6 inches above the slag line and oxygen is introduced into the back through the action of a supersonic velocity oxygen stream which parts the slag and blows well down into the molten steel producing agitation throughout the whole bath.

Rates of carbon reduction obtained are about the same, although the nonconsumable device will lend itself much more readily to mechanization of the process. Rate of carbon reduction, of course, will vary with the carbon content of the steel. At high carbon contents, the reduction rate may be as high as 2 points per minute. Even with carbon contents of 15 or 20 points, the rate of carbon drop using oxygen will be about 1 point a minute. On the average, 100 to 300 cubic feet per ton of oxygen are required for decarburization, and saving of heat time of 10 to 20 per cent results.

Oxygen in the Steel Industry, by H. W. McQuaid, consultant and F. E. Pavlis, technical director, Air Products Inc.: Some discussion is taking place concerning the used of oxygen for blast enrichment in the bessemer process. The value of oxygen addition is in increasing production obtained by using increased temperature to permit large steel scrap additions.

European tests of oxygen for blast enrichment in the blast furnace shows the possibility of increasing iron production with an increase of approximately 25 per cent in oxygen going into the furnace with no corresponding increase in nitrogen. This increase represents about 3300 cubic feet of oxygen added per ton of iron made. An increase in production of about 30 per cent and a coke decrease of about 150 pounds per ton is claimed. For blast enrichment in the large open hearth, the indicated requirement of oxygen is more than 600 cubic feet or about 16 tons per furnace per day on a 200-ton furnace.

In electric furnaces, some oxygen can be used to advantage in cleaning the banks, and in speeding up melting on almost any heat. The saving in power will usually more than pay for the cost of the high-purity oxygen.

Scrap must be above the ignition point in temperature and the concentration of oxygen at the point of application must be close to 100 per cent pure. If the temperature is much below 2250 degres Fahr., the reaction also will slow up and much oxygen will be wasted.

Use of oxygen for short time in the bath to help get the lime up is also beneficial. The whole bath increases in temperature and the lime boil starts uniformly and much can be saved. Usually compressed air will work just about as well as oxygen for this purpose, especially when the carbon is above 0.50 per cent. For reducing carbon, it has been the experience of some that oxygen is best for low-carbon ranges, but that air is more economical in the higher carbon ranges. The rate of carbon drop can be controlled and varied according to conditions from 0.60 per cent carbon per minute to 0.02 per cent carbon per minute.

The lower rate is obtained by the use of relatively low pressure air (about 2 pounds per square inch at the orifice) introduced through a simple 2-stem pipe. A length of 2-inch pipe fed through a short piece of 1-inch pipe will reduce a 90 pound per square inch line pressure to about 2 pounds velocity pressure at the outlet.

It is believed that combinations of oxygen and air will be used eventually for carbon reduction, with 100 per cent air in the high-carbon ranges and 100 per cent oxygen in the low-carbon ranges. This will facilitate the use of higher iron charges in the

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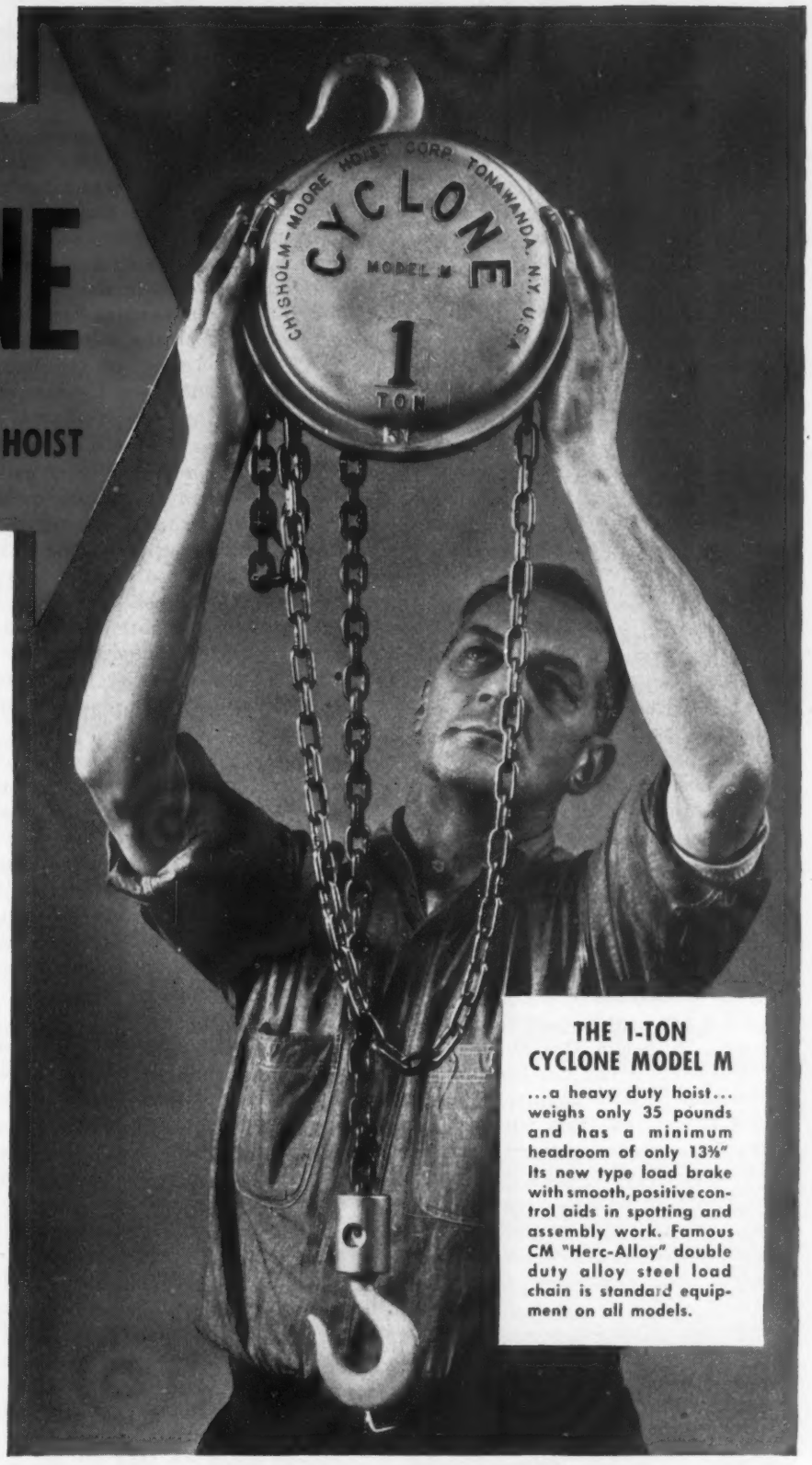

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open-hearth and electric furnaces as well as the making of low-carbon grades. By speeding up the ore and lime boils and getting the temperature and action up on cold heats, and by helping a poor slag to shape up it will be found that oxygen (and air) will become a valuable tool for melting furnaces. By reducing to a few minutes the time required to decarburize high-carbon meltdowns, we have a means for increasing high iron and hot metal charges in the electric furnace and open hearth. This promises to change the economics of the electric furnace in the future.

Accelerating Rate of Carbon Elimination of the Open-Hearth Bath, by J. N. Hornak, assistant division superintendent, Open-Hearth Department, Carnegie-Illinois Steel Corp., Homestead, Pa.: From the operating standpoint the lance was the simplest tool to use and it was used throughout the study to inject gas into the bath. In addition to pure oxygen, other gases experimented with included: 90, 70, and 44 per cent oxygen, 20.8 per cent oxygen (synthetic air, dry), compressed air (regular) and pure nitrogen.

On heats worked with lime and ore, the average nitrogen residual is 0.004 per cent. This same average residual was found also on the heats agitated with gas, with the exception of 70 per cent oxygen and pure nitrogen, where residuals of 0.005 per cent and 0.006 per cent respectively were obtained. Although this increase in nitrogen content has not been found detrimental to steel quality, it is intended to continue this part of the study.

When a heat is blown with any of the oxygen bearing gases, the residual manganese falls off as the tapping carbon is approached, generally finishing below 0.10 per cent when 0.08 per cent carbon is reached. In the case of pure nitrogen, however, there is a reversion of the manganese from the slag to the metal and, with this reversion of manganese, the FeO of the metal increases less rapidly than normally. This may be a pertinent item toward steel cleanliness.

Bath temperatures were taken by means of an immersion pyrometer. The operator checked the pyrometer readings against furnace conditions and then either increased or decreased fuel input as required. For example, in a test heat blown with nitrogen, the rate of fuel input was increased to maintain a desired temperature, while in the case of blowing with 99.5 per cent oxygen, a considerable decrease in fuel input was made to avoid overheating the bath. This fuel reduction results in a saving that favors the use of high oxygen content gases.

Although there was, in some cases, considerable variation of the data from heat to heat, there was a fairly good correlation of the averages of the various groups. Analyses of the data for three of the gases used shows a considerable spread in the rate of carbon drop for the same melt carbon range; also that as the melt carbon or the carbon content of the bath at start of blow increases, the rate of carbon elimination also increases.

On heats blown with 99.5 per cent pure oxygen, where the rate of carbon drop is plotted against the total ore charged, it is shown that for the same pig percentage, as the ore charged was increased and the heats melted lower in carbon content, the rate of carbon elimination was also lower. In reducing the pounds of ore charged, there is a fuel saving in that there is less cold material to melt in the furnace.

Average rate of carbon removal for each of the gases in each carbon range, plotted against the carbon content of the bath at start of blow, shows that as the carbon content at start of blow decreases the rate of carbon elimination is reduced. Also, as the oxygen purity of the gas is reduced, the rate of carbon elimination is likewise reduced.

Merely agitating the bath with an inert gas such as nitrogen increased the rate of carbon elimination over and above that obtained with normal working procedure where lime and ore are used. These results indicate that, when oxygen-bearing gases are used, part of the oxidation of the carbon takes place by a more rapid intermingling of the steel of the bath and the iron oxide of the slag; also, by the exposure of the steel to the highly oxidizing atmosphere of the furnace. The maximum rate of carbon elimination will take place when the oxygen content of the agitating gas is between 90 and 100 per cent. This does not mean that the 90 per cent or 99.5 per cent oxygen gas is the most economical to use as the cost of the oxygen-bearing gases varies considerably, depending on their composition.

As the oxygen content of the agitating gas is reduced, the cubic feet of gas consumed per point of carbon eliminated increased slightly; however, the quantity of oxygen consumed per point of carbon elimination falls off at a rapid rate.

Progress of High Top Pressure Operation of the Pig Iron Blast Furnaces by B. S. Old, E. L. Pepper and E. R. Poor, Arthur D. Little Co., New York: Some of the engineering alterations that are involved in conversion of a blast furnace and its plant to permit high top pressure operation will vary with different installations but there are many changes that will apply to any blast furnace.

Maximum iron tonnages will result from blowing more wind, hence it is logical that greater blowing capacity is desirable. Flue gas under high top pressure conditions represents a potential source of power which might be used to operate a booster blower furnishing additional wind and pressure desired. Power would be derived by expanding the hot flue gases through a gas turbine, the exhaust gases still retaining their heating value for boiler and stove consumption. It is advisable to investigate the hot blast valves to make sure they are adequate in size and strength to handle the added load. A minor but important difficulty often encountered is the buckling of manhold covers and inspection plates due to increased pressure, but this can be overcome by reinforcement.

Pressure drop in the cold and hot blast mains should be held around 1.5 pounds per square inch in order not to overtax the blower from a consumption standpoint.

If the pressure inside the large hopper is made equal or about equal to the furnace top pressure when it was desired to charge the furnace, the large bell can be lowered without any major alteration to existing operating equipment.

An important consideration in the installation of the large bell and hopper is to check their alignment with respect to each other. They should be so aligned as to seat evenly all around when the bell is raised because if the bell is slightly off-centered, one side of the bell will contact the hopper before the other and thus set up a pendulum motion which will greatly increase the wearing of the two seating surfaces. Due to the extreme erosiveness of the bled gases and the large pressure drop through the valve under high pressure conditions, the life of the standard bleeder valve has been reduced to about six months. Hard surfacing has not prolonged the life to any considerable extent. It is believed that if clean gas could be used to relieve the furnace of excessive pressures during slipping, the bleeder problem could be solved. Its use would solve two

Stronger, Lighter Hand Truck Made by Welding Tubular High Carbon Steel

BY JAMES B. HOWLAND, PARTNER
TUBAR BENDING & MANUFACTURING CO., CLEVELAND, OHIO

THE new Tubar Hand Truck has outstanding strength and low weight because it is made of tubular high carbon steel with an exceptionally thin wall (.076″). Frame of the largest model Tubar weighs only 36 pounds, yet carries a 1,000-lb. load. Fig. 1 shows how light it is. The addition of reinforcing tubes from the kick-bar to the handle (see Fig. 3) makes a "stevedore" model with a 2,500-lb. capacity. Conventional hand trucks of these capacities weigh more than twice as much.

The all-welded tubular frame ha other advantages in addition to lightness. Constructed without bolts or rivets, it has a smooth top and bed without obstructions. There is no danger from wood splinters or sharp edges of metal. Design of the frame distributes the load and reduces dead weight on the axle, facilitating handling. The operator's hands follow the curve of the handle in "breaking" the load to a pulling or pushing position. The Tubar Truck is patented.

Fig. 1. Demonstrating the lightness of the Tubar truck.

JIGS USED IN WELDING

We use two sizes of tubing—1 1/16″ O.D. and 7/8″ O.D. The smaller telescopes into the larger size at the maximum stress point, for greater strength. The tubes are bent on a bending machine (see Fig. 2). The toe plates are bevelled and forged to a point. Toe-plate sides are cut from 3/4″ high carbon steel plate by an acetylene cutting machine. The frame parts are assembled in a jig and tack-welded, then finish-welded in another jig (see Fig. 3).

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Further information on the procedure for this electrode may be obtained by writing THE LINCOLN ELECTRIC COMPANY, Dept. 159, Cleveland 1, Ohio.

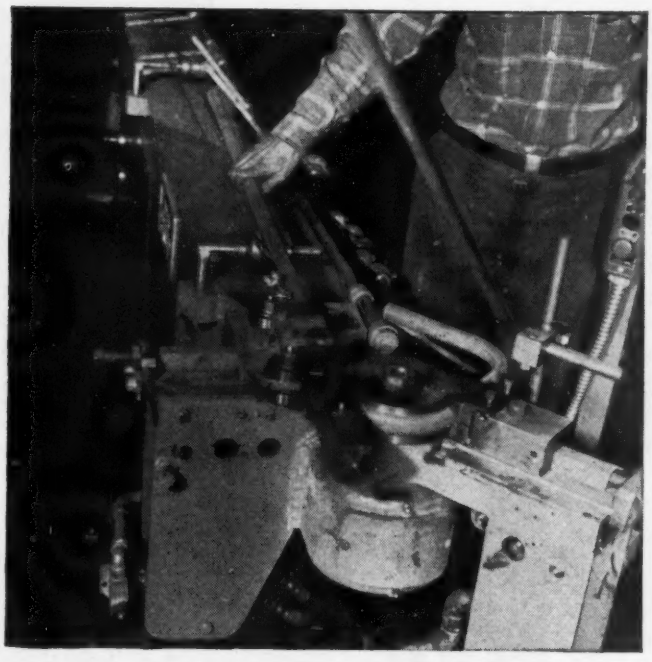

Fig. 2. All bending is performed on a tube bending machine.

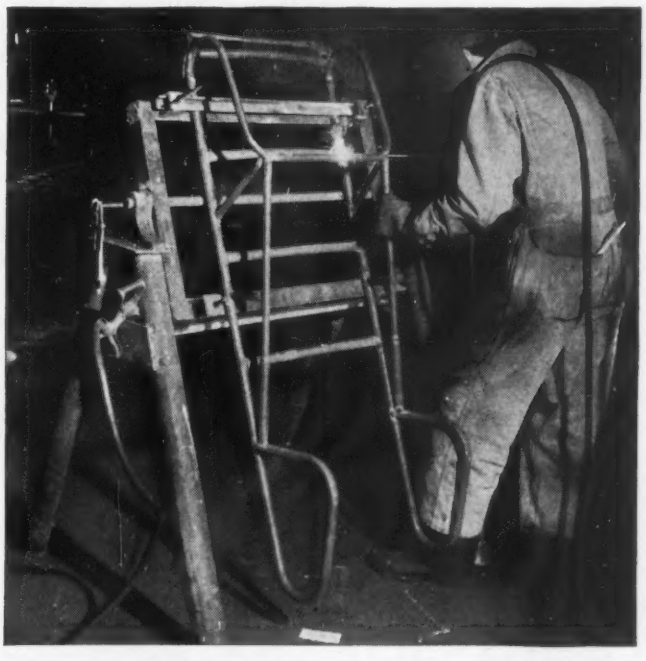

Fig. 3. Finish-welding a "stevedore" model. Jig rotates so most welding is in downhand position.

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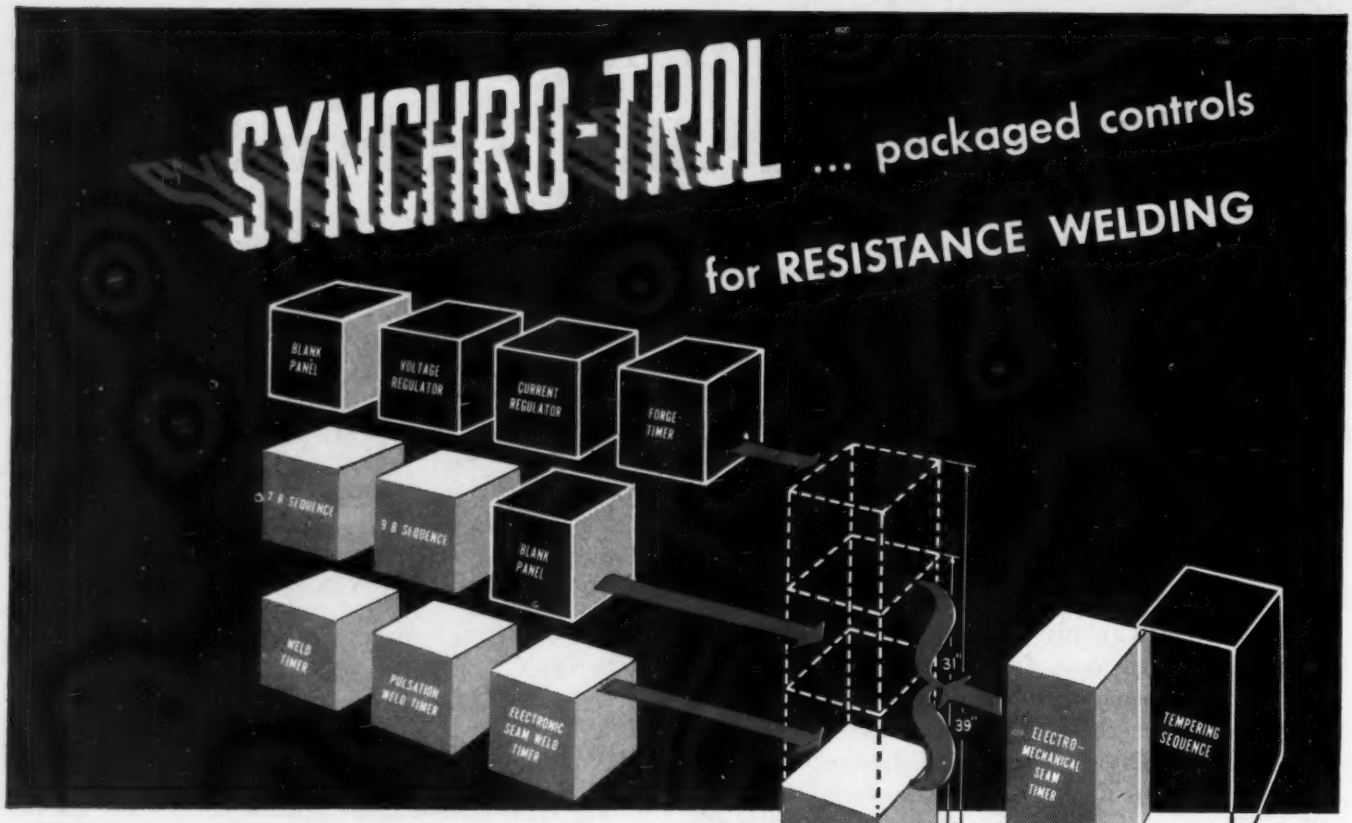

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Electronics at Work

important problems. First, the cost of maintenance of bleeder valves will be greatly reduced. And second, civic complaint of blowing flue dust periodically over the surrounding countryside will be practically eliminated.

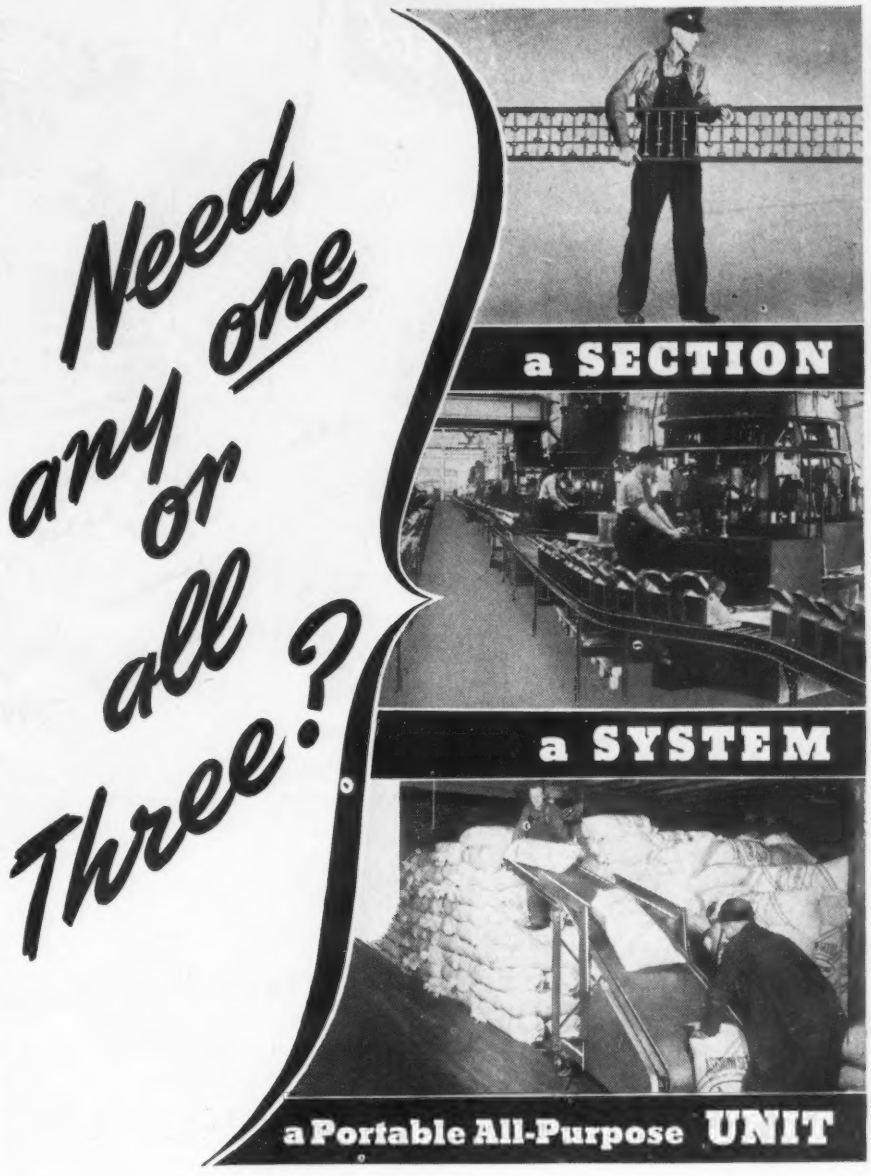
The problem of maintaining the water seal on the bottom of the wet washer when the furnace slips has given as much trouble as any single mechanical difficulty experienced thus far. A method which resulted in solving this problem consists of installing an electric thruster operated butterfly valve in the water discharge piping, the thruster being controlled by a float arrangement working on the actual water level inside the washer. When the water level rises in the washer, the float acts to cause the thruster to open the butterfly valve and conversely close the valve. An emergency overflow is provided in case the regular discharge line and control become inoperative.

Iron tonnage for the last three weeks in March and for April at Republic's No. 5 Cleveland furnace averaged 1552 tons per day at dry coke of 1552 pounds per ton of iron. Wind blown was 95,600 cubic feet at turboblower and 125 pounds flue dust were produced per ton of iron. Tonnage increase was 7½ per cent over the 1430 tons in September, October and January periods which can be accounted for by a corresponding increase in the iron content of the burden through the use of some scale and sinter. Tonnage for the first two weeks in May averaged 1437 tons which is about the figure expected for a straight ore burden.

An increase in the average static pressure of a blast furnace decreases the volume and increases the density of the gases passing through the furnace. An increase in the average pressure thus permits more wind to be blown, and more iron produced at a lower coke rate without increasing the linear gas velocity through the furnace to a point where hanging, slipping, channeling, and dusting make furnace operation impractical and uneconomical.

By increasing the average pressure, the furnaceman can blow his furnace in any one of the following manners and still better his normal practice:

1. Blow the furnace at substantially higher wind rates still maintains the gas velocity at the normal value.
2. Blow the furnace at normal wind rate and substantially decrease the gas velocity through the furnace.
3. Blow the furnace at an inter-



THE range and versatility of Standard Conveyor equipment is the result of nearly 40 years of close contact with conveying problems — large and small installations.

If you need just a light, portable section of conveyor to speed handling in warehouse or on shipping platform — complete, continuous flow system linking manufacturing or packaging operations — or a portable unit to speed handling in storage and shipping areas — Standard Conveyor Company can supply you with any one or all three.

Write for "Conveyors by Standard" Bulletin No. S1-107 — a valuable conveyor reference book that will be useful to you.

STANDARD CONVEYOR CO.
General Offices: North St. Paul 9, Minn.
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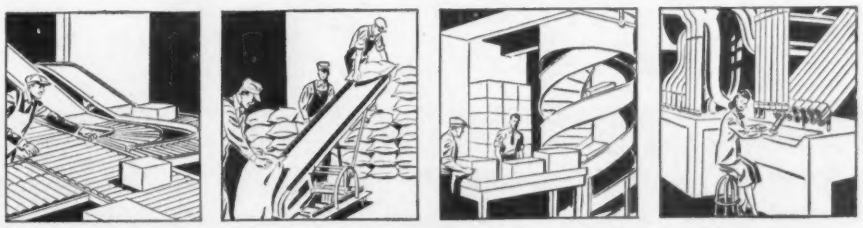

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If you wish more information on any of the fasteners shown below, please send for a free copy of the new Lamson & Sessions brochure on SPECIAL PURPOSE FASTENERS. Better do it *now*. It may mean money in your pocket!

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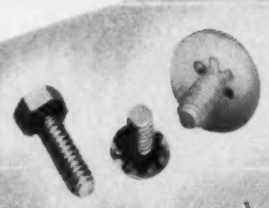

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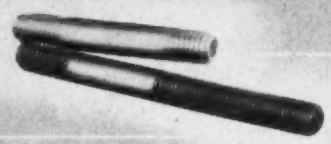
LAMSON LOCK NUTS—One-piece, all-steel—can be re-used repeatedly



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DARDELET RIVET-BOLTS with the locking thread . . . time savers for steel construction

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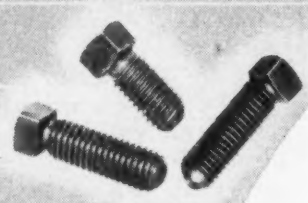
PLACE BOLTS—for locking assemblies rigidly



"1035" SET SCREWS of hi-tensile heat-treated steel, square head or headless

"BENT" Bolts, including U Bolts, J, L, Hook and Eye Bolts

WIRE ROPE CLIPS with the new Hi-Center Saddles and extra-strength U Bolts

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LOK-THRED Studs and Pipe Plugs—*Thread locks and seals in* standard tapped holes

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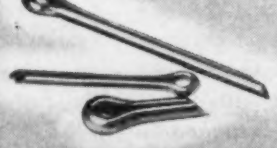

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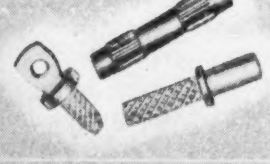

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AIRCRAFT PRODUCTS: AN Bolts, Nuts, Screws, Studs, Cotters (including Stainless Cotters)

"BOLTS, NUTS & SCREWS"—a compilation of important technical articles on the manufacture, inspection, specification and use of fasteners; order from The Lamson & Sessions Co. at $1.00 per copy.

"BOLT, NUT & RIVET STANDARDS"—a complete and up-to-date standards book on commercial fasteners. *Available* only from the American Institute of Bolt, Nut & Rivet Manufacturers, Hanna Bldg., Cleveland, Ohio. $2.00 per copy.

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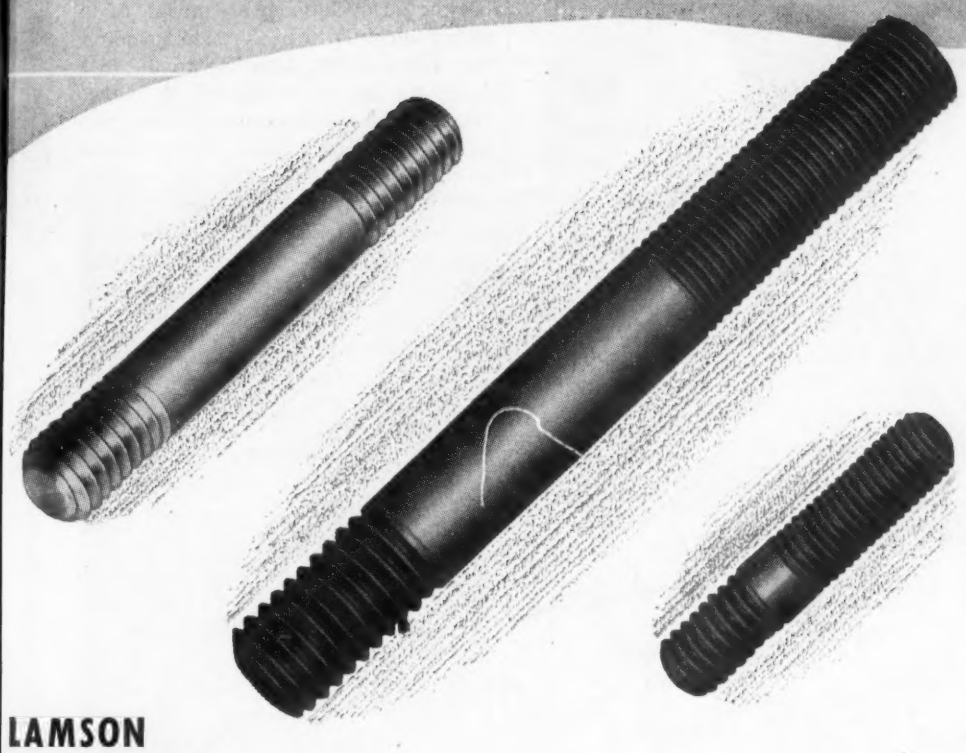
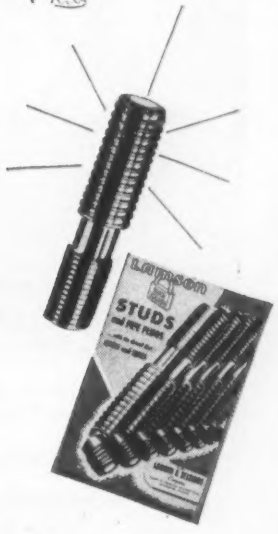
for PRECISION and HOLDING POWER!





LAMSON MILLED STUDS

Lamson Milled Studs are a great deal *more* than accurately made threaded fasteners. They are precision engineered parts—manufactured on the most modern equipment and tolerance-controlled for ease and speed in assembly operations.

Threads and shanks are true and concentric; which means that Lamson Studs turn straight in tapped holes and stand straight and true to receive other parts. There is no fumbling or forcing to assemble mated parts.

Lamson Milled Studs are available with standard length threads or can be made to order with any required special thread length. We are also equipped to manufacture precision aircraft-quality studs, having made millions of them within tolerances of two ten-thousandths of an inch.

LAMSON LOK-THRED STUD

This new patented "super" stud fits into standard tapped holes, yet it *locks* and *seals*. For complete technical information on the Lamson Lok-Thred Stud, send for our free illustrated LOK-THRED booklet.

THE LAMSON & SESSIONS COMPANY
1971 West 85th Street • Cleveland, 2, Ohio
Plants at Cleveland and Kent, Ohio • Birmingham • Chicago

SPECIAL PURPOSE
Lamson + Sessions
FASTENERS

• FURNITURE BOLTS • SEMI-FINISHED NUTS • LAMSON LOCK
EP BOLTS • ELEVATOR BOLTS • STOVE RODS • TRACTOR BOLTS
TS • SPRING CENTER BOLTS • HUB and WHEEL BOLTS • CONNECT
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UTS
UNCH
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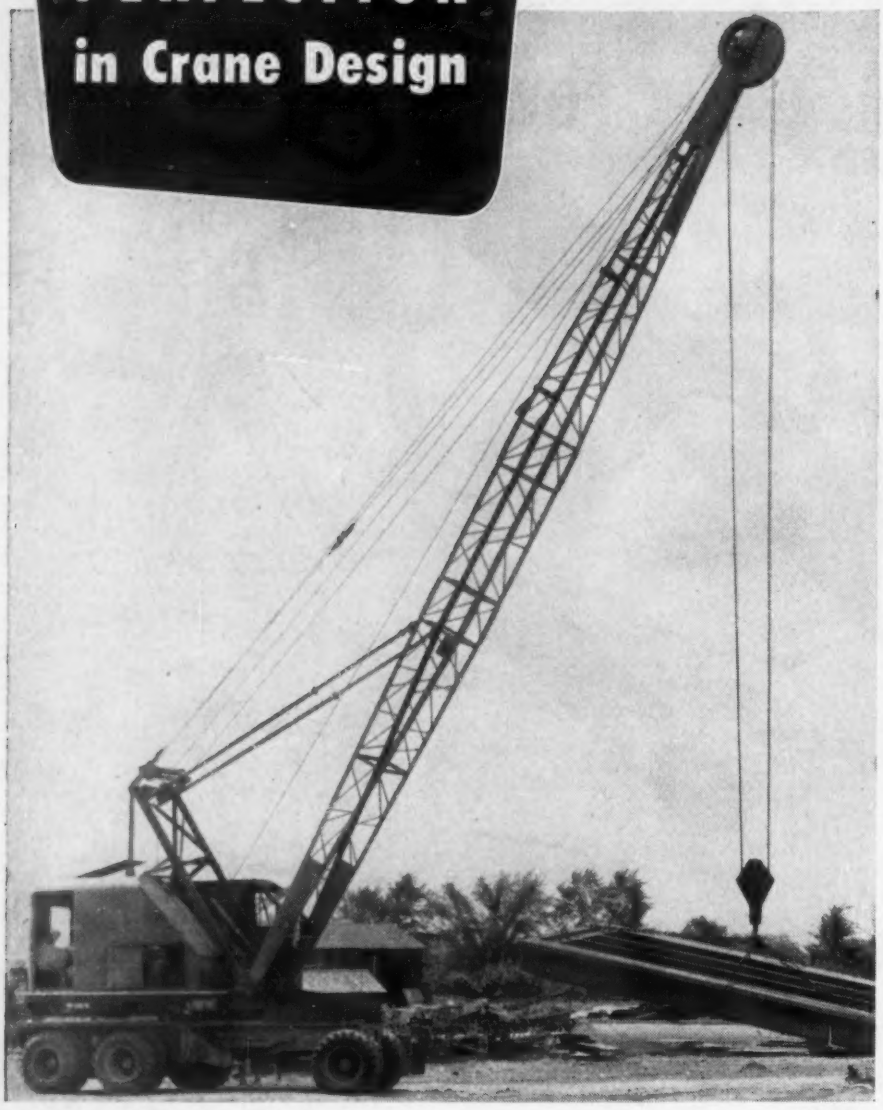
• WEATHER-TIGHT
S SCREWS • CAP SCREWS • FIN HEAD

PIONEERING PERFECTION in Crane Design



Expect the most from *Mobilcranes*, for here are sturdy, powerful machines incorporating proved advancements in design and construction. Pioneering the very features that have become standard for the industry, **OSGOOD** and **GENERAL** have developed, in *Mobilcranes*, smooth-working, efficient units that will handle the biggest jobs in record time.

Whatever your materials-handling problem, you'll find that **OSGOOD** and **GENERAL** *Mobilcranes*—one-man operated, one-engine powered, mounted on rubber—can do the job at a savings in time, money and manpower.

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DIESEL GASOLINE OR ELECTRIC POWERED • ¾ TO 2½ CU. YD. • CRAWLERS & MOBILCRANES

mediate point obtaining a material increase in wind rate while maintaining the gas velocity well below normal.

The majority of the mechanical alterations necessary to convert a blast furnace and plant for high top pressure operation are easy to engineer and construct and exclusive of blowing equipment are inexpensive, averaging not over $125,000.

New Techniques in Conditioning Stainless Steel by A. E. Hamilton, Jr., Hamilton Pump Co. Inc., Pittsburgh: Developmental model of a slab grinder is in production grinding flat surfaces of slabs up to 30 feet long, 24 inches wide and 4 inches thick. The machine grinds two surfaces of slabs at once. All grinding is done under water which is applied at controlled pressures and volume directly into the face of the wheel from under the swing arm and at the sides of the wheel by spraying nozzles. All cuttings and dust are smothered and washed into the front splash guard and removed in the lower tote box periodically. Slabs are gripped rigidly by special air vises which can be used for turning the slabs.

Wet grinding not only keeps the wheel cool and prolongs its life but keeps the steel cool while being conditioned. In the case of 18-8 steel cool grinding reduces the tendency of the metal to distort. With the automatic grinder, the wheel can be positioned on a surface crack and will whisk out the lengthy seam at full speed. The steel and wheel being cool, there is no deepening or widening of the seam unless it is an oxidized crack running deep into the thickness of the slab.

The automatic grinder by its pneumatic cylinder imparting a resiliency to the swing arm enables the wheel to climb contours. At the same time, uniform pressure is applied in grinding all parts of the surface and thus no wheel bouncing. A mechanical change is now in progress which will at least double the running speed, thus reducing grinding time to less than ½ man-hour per ton.

In finishing strip on the new Hamilton grinding and finishing machine, the strip from an uncoiler is fed between the top and bottom rolls and taken up on a coiler. The rolls are built of steel sections on a shaft with bearing cages mounted in bearing blocks in the vertical housings. A pneumatic rubber drum 24-inches in diameter covers the steel rolls like a sleeve. Finally, coated abrasive coverings, cut out on a diagonal from standard abrasive rolls, are wound

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COLD FINISHED BARS • SHAFTING • TEMPERED AND ANNEALED SPRING STEEL • DRILL ROD • SHIM STEEL • COLD ROLLED STRIP STEEL • COILS AND STRAIGHT LENGTHS • ROUND EDGED STRIP STEEL • FEELER GAUGE • ROUND WIRES • STEEL BALLS

The entire line of Gensco cold finished bars is most complete and ready for use on your production or tool room equipment to produce the most intricate parts.

Stocks include rounds, squares, hexagons, and flats from leading mills in a complete range of sizes and analysis—Bessemer and Open Hearth.

Gensco Sales Engineers will be happy to call and discuss your requirements as well as your steel working problems. Your order will receive immediate and thorough attention and your needs will be supplied to your individual exacting requirements.

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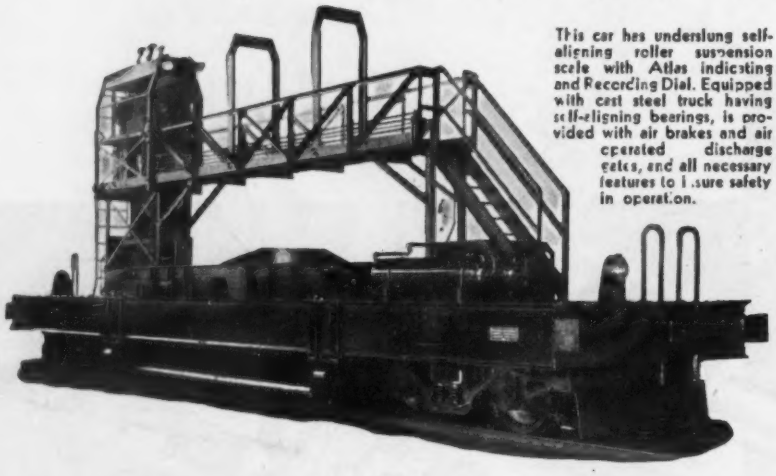
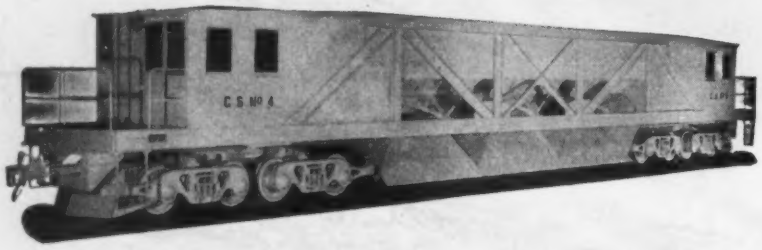
ATLAS

ORE TRANSFERS AND SCALE CHARGING CARS

30 TON CAPACITY DOUBLE HOPPER SCALE CHARGING CAR



This car has underslung self-aligning roller suspension scale with Atlas indicating and Recording Dial. Equipped with cast steel truck having self-aligning bearings, is provided with air brakes and air operated discharge gates, and all necessary features to insure safety in operation.



120-TON SIDE DUMP ORE TRANSFER CAR

Used for stocking and reclaiming. Hopper has three compartments each with independently operated discharge gates. Double end control so that operator is always in the front end of the car. Car is powered by four 125 Horsepower Motors with series parallel reversing-plugging type, full magnetic control. Hoppers are provided with electric heaters to prevent freezing of load in severe weather.

Builders of:

DIESEL ELECTRIC AND STORAGE BATTERY LOCOMOTIVES FOR INTERPLANT HAULAGE

SCALE CHARGING CARS AND ORE TRANSFERS FOR BLAST FURNACE STEEL PLANTS

COAL CHARGING CARS, CLAY CARRIERS DOOR EXTRACTORS, COKE GUIDES AND COKE QUENCHING CARS FOR BY PRODUCT COKE PLANTS

TURNTABLES

INDICATING AND RECORDING DIALS FOR WEIGHING SCALES

The ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

1100 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

spirally onto the rubber drums. These coverings are held tight by steel retaining bands after the drum has been inflated. The rolls are operable vertically by a screwdown switch.

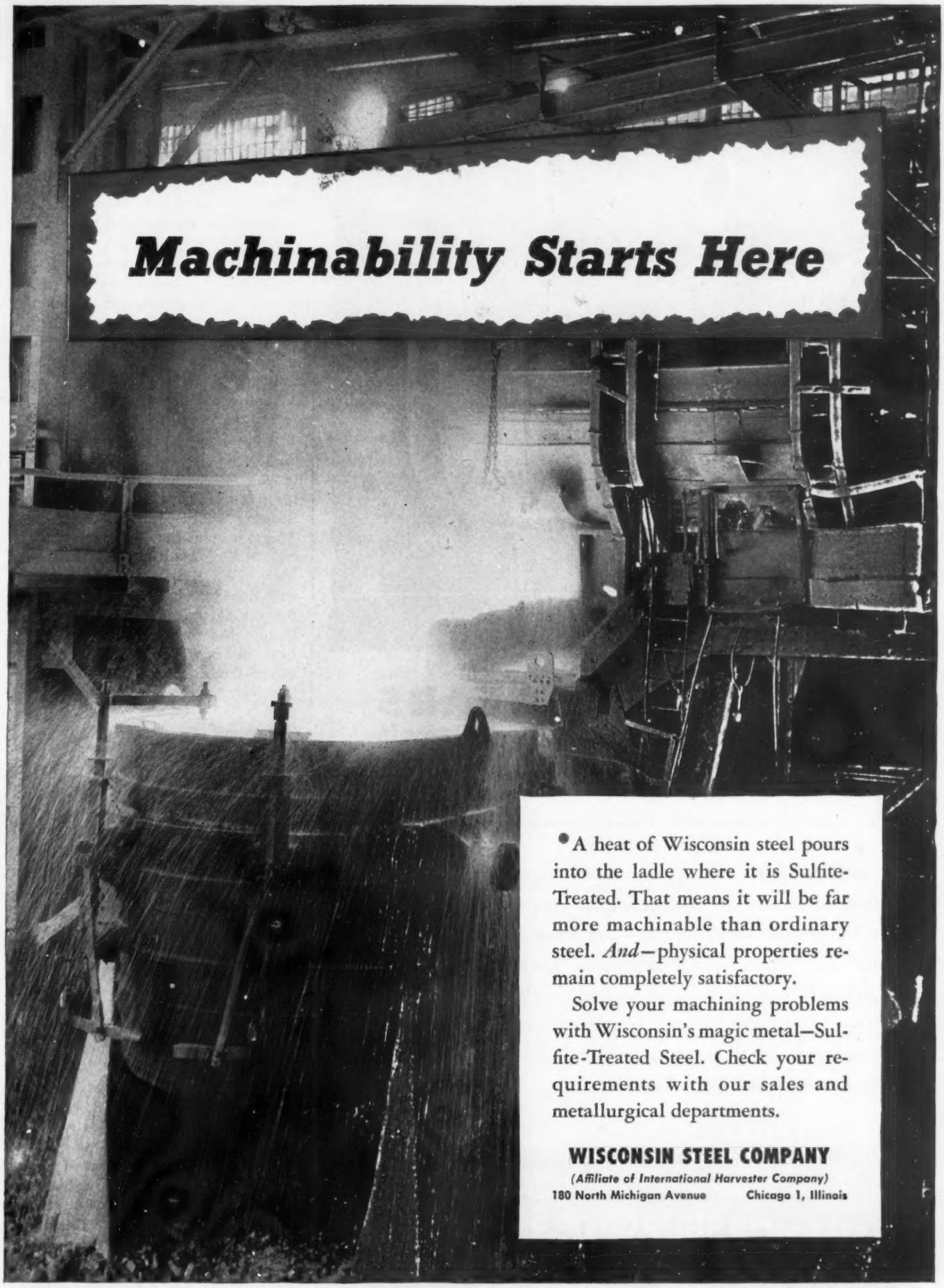
Equipment is enclosed with splash guards so that liquid can be forced between 80 to 100 pounds into the drum cavities and combination pass line roll and scrubbing box. Oscillation is provided on a horizontal plane parallel to the strip. The whole machine moves slowly and transversely in a reciprocating base to the desired distance on both sides of the work. Diagonal grinding is accomplished by a gear tooth swivel base so that the machine can be quickly turned angularly to the longitudinal travel of the work.

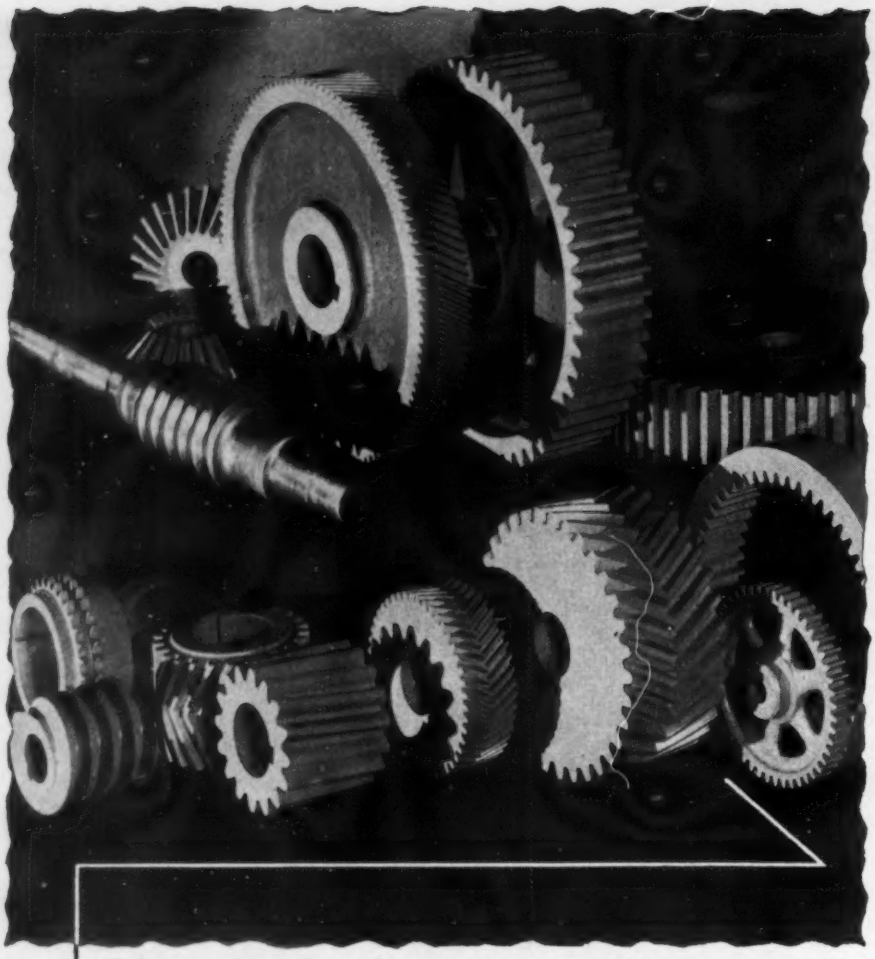
Speeds of these drums usually range between 4000 to 6000 surface feet per minute depending on the operation required. With proper coiling facilities, the travel speed of the strip can range up to 500 feet per minute.

Trends in Lifting Magnet Design and Application by J. D. Leitch, chief engineer, Electric Controller & Mfg. Co., Cleveland: The coil of the new all-welded magnet is a steel enclosed hermetically sealed unit which can be carried as a spare part. The coil is wound in layers on a steel hub as in the old design, but instead of a brass bottom plate fastened with screws, a steel plate is now welded to the hub.

After the coil has been wound, it is enclosed in a prefabricated metal cover or shell of mild steel. The cover is welded to the hub and to the bottom plate of the coil while held under pressure. The cover, therefore, acts as a clamping means to prevent the coil from rotating about the hub. Leads are brought out of the coil cover through a heavy block of insulation and sealed with glyptol. The inner pole shoe has a conical surface accurately machined for intimate contact with a corresponding surface on the magnet case. Elimination of clamping bars and bolts permits greater use of available coil space for active winding while elimination of outer shoe bolts provides a coil space of greater radial length. These factors permit the design of a flatter coil which presents a greater surface area for more efficient heat dissipation.

An important change in the coil design of this magnet is the use of a steel bottom plate instead of a brass plate. The effect of a steel plate in reducing the magnetomotive force across the pole shoes is negligible and there is no appreciable change


Machinability Starts Here
• A heat of Wisconsin steel pours into the ladle where it is Sulfite-Treated. That means it will be far more machinable than ordinary steel. *And*—physical properties remain completely satisfactory.
Solve your machining problems with Wisconsin's magic metal—Sulfite-Treated Steel. Check your requirements with our sales and metallurgical departments.
WISCONSIN STEEL COMPANY
(Affiliate of International Harvester Company)
180 North Michigan Avenue Chicago 1, Illinois
WISCONSIN SULFITE-TREATED STEEL



"HARD-DUR" GEARS

handle the tough jobs

"HARD-DUR" Gears preserve the tooth form because they are made of the finest gear steels and are scientifically heat treated. They are so much more wear-resistant than similar untreated gears that they are guaranteed to have four to five times the life and at only 50% extra in cost. Harder tasks on which ordinary gears fail become easier with Horsburgh & Scott "HARD-DUR" Gears.

Send note on Company Letterhead for 488-Page Catalog 41

THE HORSBURGH & SCOTT CO.

GEARS AND SPEED REDUCERS

5112 HAMILTON AVENUE • CLEVELAND 14, OHIO, U. S. A.

in the lifting capacity of the magnet in handling low permeance loads.

Replacing the coil of a welded magnet is merely a matter of cutting away the welds between the case and the inner and outer pole shoes along with the two welds which fasten the coil to the magnet case. A new coil can be carried in stock and installed at once by welding it in place. The inner and outer pole shoes can then be welded in position and the magnet returned to service.

Tests have been made to prove that in handling pig iron 20 per cent greater lifts can be obtained if the magnet is permitted to settle down on the tile before energizing it. When short crane movements are made for each lift, however, it might be found more advantageous to energize the magnet before reaching the tile.

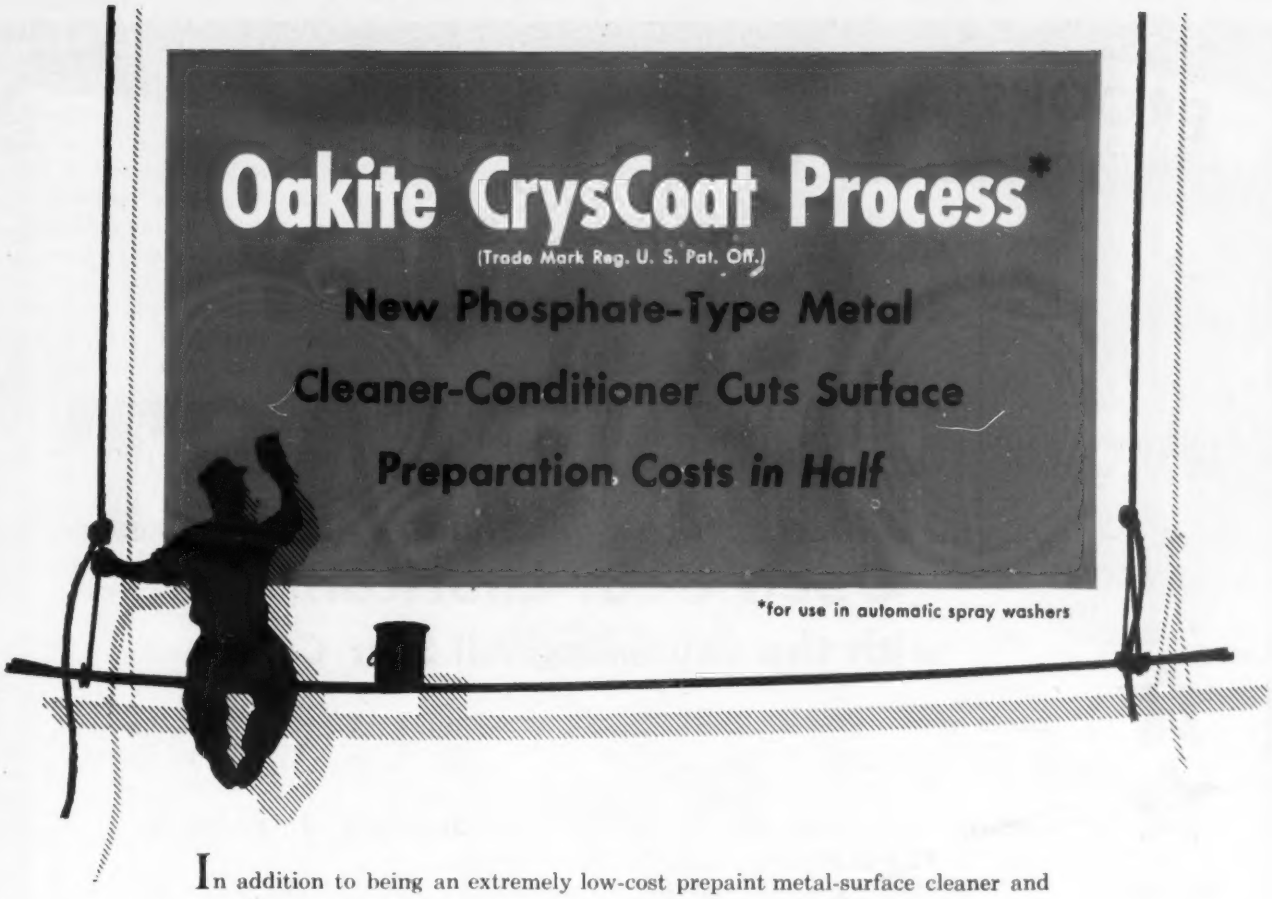
It is recommended that a magnet used in handling hot steel be dunked in water occasionally to protect its insulation against excessive heating.

Soaking Pit Operations, by H. V. Flagg, combustion engineer, American Rolling Mill Co., Middletown, Ohio: We have found that our 1-way fired pits operate well on either fuel oil, natural or coke oven gas, although the consensus is that better heat distribution in the pit is obtained from fuel oil, due probably to the long flame characteristics of that fuel.

Influence of reserve soaking pit capacity on mill production is reflected by the fact that at present with a total charging capacity of 208 ingots, we are rolling 11,000 tons more per month on our hot strip mill than we did in 1944 when pit capacity was 152 ingots. This production increase cannot be credited entirely to the increased soaking pit capacity though the increase could not have been accomplished without it.

Overall fuel with charging capacity of 208 ingots including warmup, holding and operating fuel, is 1.275 million Btu per net ton. Average fuel for 1946 with 184 ingot charging capacity was 1.135 million Btu per net ton, with 32 per cent cold steel and 0.995 billion Btu with 25 per cent cold steel.

The combination of an ejector stack and a well worked out temperature control on one of our installations has provided regulated combustion air temperature. Heating is faster and more even, fuel economy is better, furnace life is extended, maintenance less costly, and washing of ingots absent. Since no washed scale drops into the coke breeze bottom no slag is formed and bottom-


Oakite CrysCoat Process*
(Trade Mark Reg. U. S. Pat. Off.)
New Phosphate-Type Metal
Cleaner-Conditioner Cuts Surface
Preparation Costs in Half
*for use in automatic spray washers

In addition to being an extremely low-cost prepaint metal-surface cleaner and conditioner, the Oakite CrysCoat Process offers these output-boosting advantages:

easy to install and handle . . . minimum equipment needed

easy to control . . . no complicated testing routines

safe to use . . . no attack on iron or steel coils, piping, pumps

no scaling-up of solution-heating coils

FREE TECHNICAL BOOKLET . . . A specially prepared bulletin describes how to install the Oakite CrysCoat Process in 3 and 4 stage mechanical washers . . . or dip-tank setups. Tells how, in one operation, the process removes light oil, grease and shop dirt; lays down a microscopic crystalline-phosphate film to give paint, lacquer or enamel an ideal surface for tenacious, long-lasting paint adhesion; conditions ferrous surfaces to withstand operational rust . . . to localize scratch-corrosion on finished products.

We invite you to send for this free bulletin . . . to make full use of Oakite Technical Service for test-running the Oakite CrysCoat Process in your cleaning and conditioning set-up. Write TODAY!

OAKITE PRODUCTS, INC., 34E Thames St., NEW YORK 6, N. Y.
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Specialized Industrial Cleaning
MATERIALS · METHODS · SERVICE

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★ LEADOLENE **KLINGFAST**

Open Gear Lubricant

with the following All Star Cast

E

Each application of KLINGFAST lasts longer—*often as much as 75% longer.*

C

Cost of lubrication per ton rolled is cut drastically *in some instances as much as $2250.50 monthly.*

O

Open Gears last longer, run quieter, operate more efficiently with KLINGFAST.

N

Not affected by water, salt water, dust, heat or cold.

O

Our customers report ACTUAL SAVINGS up to 75% with KLINGFAST, in addition to manhours saved.

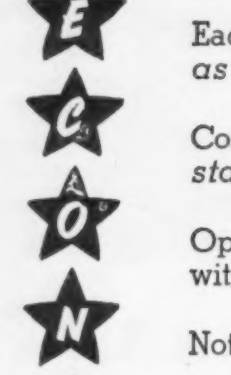
M

More and more plants are specifying KLINGFAST as the standard specification for Open Gear lubrication.

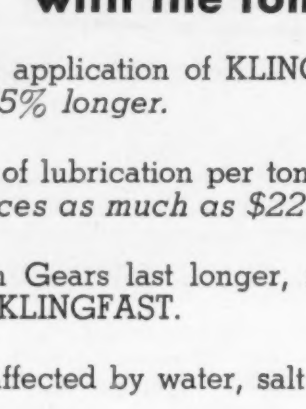
Y

You can use KLINGFAST just as it is delivered—spray, swab or pour it on Gears . . . *without heating.*

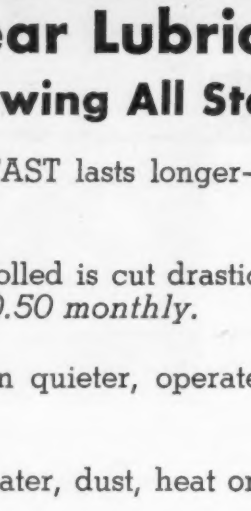
★ *THE LUBRICANT WITH I.P. "INDESTRUCTIBLE pH-ilm"*



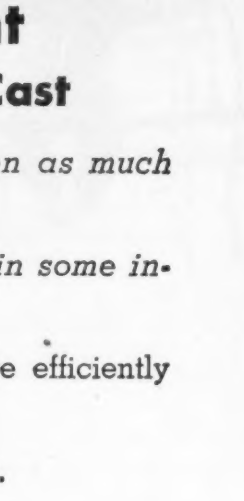
MILL SUPERINTENDENTS . . . insist on KLINGFAST because it greatly reduces labor and material costs.



MASTER MECHANICS . . . demand KLINGFAST because its efficient lubrication adds longer service-life to gears.



MILLWRIGHT FOREMEN . . . like KLINGFAST because those big piles of grease on the floor are eliminated.



SAFETY ENGINEERS . . . are enthused because no open flames are used—no chance for accidents or fires.

Write for Instructive Bulletin "Open Gear Lubrication"

THE BROOKS OIL CO.

PITTSBURGH 19, PENNSYLVANIA

CLEVELAND, OHIO HAMILTON, ONTARIO

WAREHOUSES IN PRINCIPAL INDUSTRIAL CITIES

making becomes merely a matter of raking out ashes and replenishing the coke breeze.

Experience shows that regulation of flame gas removal is as vital to good pit operation as is draft, fuel-air ratio, or air preheat regulation. Mechanical hookup of the damper to the fuel regulator permits adjusting the control to carry one pressure for full fuel load and another for light load. Pits work best with a slight positive pressure when the fuel load is high while a slight negative pressure is required when the pits are holding and the fuel load is light.

The best damper we have found is made by welding expanded metal on double U-turn cooling pipes, welding a stainless steel bearing strip around the tubes and ramming high-grade plastic refractory over the expanded metal.

Powder Process in Stainless Steel Production, by E. M. Holub, development engineer, and C. J. Burch, service supervisor, Pittsburgh District, The Linde Air Products Co.: Cutting speeds obtained on stainless steels are comparable to those obtained on equivalent thicknesses of carbon steels. The cutting oxygen pressures, however, are increased slightly, and one size larger nozzle is employed. Powder flame varies from 15 to 45 pounds per hour depending on the thickness of the material being cut.

In hand scarfing, the oxygen pressures are comparable to those used on carbon steels but the speeds are from 60 to 70 per cent lower, varying with the depth of defect and with alloy content of the material. Powder flow ranges from 30 to 75 pounds per hour depending on the quality of scarfed surface desired.

Smoke produced by the powder process is nontoxic but it should be removed by simple suction fans.

Complete severing cuts can be made on 30-inch material at a cutting speed of about 2 inches per minute. Thus, a 28 x 55-inch section may be severed in 22 minutes at a cost of $10 or less than one-half cent per square inch of cross-sectional area.

In scrapping operations, cast iron rolls up to 31 inches diameter have been cut at speed of 1½ inches per minute. Powder cutting of lumps from ingot molds now is being done. Lumps up to 24 inches thick have been trimmed from molds economically. Removal of flash from molds also is being accomplished by the powder process.

Multiple Fuel Burners for Open-

(*Please turn to Page* 124)

FOR YOU...

FOR 25 years or more steels with an alloy content of 18% chromium and 8% nickel have shown such remarkable resistance to corrosion that they are called the "stainless" steels. In plant, office, home, or club—at work or at play—they serve you, protect you, add to your pleasure.

Although basically the same, the modern, 1947 models of the "18 and 8" stainless steels have been given a lot of PLUS values by recent metallurgical experience. The analysis of Lebanon's Circle Ⓛ 22M (left) is a typical example. In addition to slight increases in the percentages of chromium and nickel, 0.25% of selenium is added. This materially improves the machining and threading characteristics of the castings—an important PLUS value to many manufacturers—perhaps to YOU.

If castings are part of your product, or corrosion one of your troubles, you or your design engineer should have a complete file of Lebanon Data Sheets describing these alloys. Write for them today.

LEBANON CIRCLE Ⓛ 22M

NOMINAL ANALYSIS

Carbon Max.	0.07
Silicon	1.25
Manganese	0.75
Chromium	19.50
Nickel	9.00
Phosphorus	0.12
Selenium	0.25

NOMINAL PHYSICAL PROPERTIES

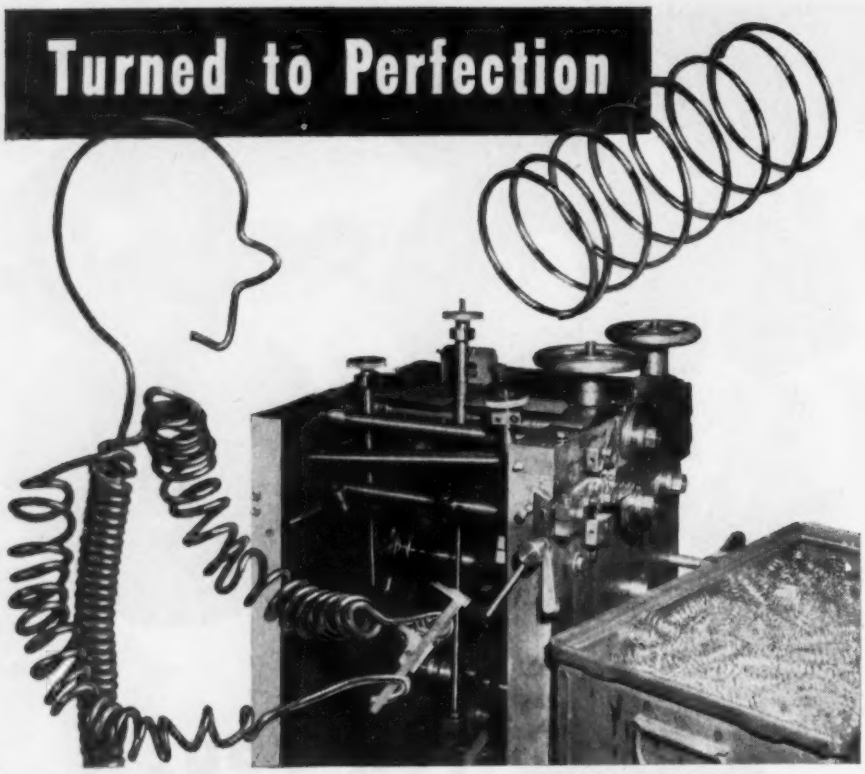
Tensile Strength	80,000
Yield Point	40,000
Elongation in 2"—%	45
Brinell Hardness	160

LEBANON STEEL FOUNDRY • LEBANON, PA.
"In The Lebanon Valley"
ORIGINAL AMERICAN LICENSEE GEORGE FISCHER (SWISS CHAMOTTE) METHOD

LEBANON ALLOY AND STEEL Castings

CIRCLE L

Turned to Perfection



Coil Springs by Illinois Coil Spring Co.*

made of KEYSTONE MUSIC SPRING WIRE

Music Spring Wire is the aristocrat of wire manufacture, requiring care and skill far above ordinary wire.

By its very nature, Music Spring Wire is difficult to draw uniformly—yet uniformity is absolutely necessary for a satisfactory precision spring.

Keystone Music Spring Wire has gained its popularity through the high degree of *uniformity* achieved . . . uniformity that pays off to spring manufacturers by simplifying their production problems and assuring end products of highest quality.

**Illinois Coil Spring Co., Chicago, Ill.*

KEYSTONE MUSIC SPRING WIRE

SPECIAL ANALYSIS WIRE for all industrial purposes

KEYSTONE STEEL & WIRE COMPANY
PEORIA 7, ILLINOIS

Cuts Material Costs

(*Concluded from Page* 89)

the stroking head in the center may be seen in Fig. 2.

7—Hydraulic system visible on the right in Fig. 3 which actuates the ram for the stroking head. No other power is required as the strip is pulled by the stroking head through the pinch rolls and leveling rolls.

As may be seen in the background in Fig. 2, this machine feeds the strip in the fixed lengths required to a mechanical press fitted with shear blades. Through a mechanical link, the foot pedal of the press is tripped as each length of strip is fed into it.

MacKenzie engineers report that the machine was moved to its present position by the overhead crane serving the section of the plant in which it is located and that it could be just as readily shifted to any other part of the plant if required.

This type of machine may be used for feeding strip directly into slitters for recoiling into narrower widths or, as an alternative, cut lengths may be fed into the slitter. As another suggested setup, the machine may be used for feeding strip into a press for performing notching, stamping, embossing or other operations where a continuous, rapid feed makes it possible to increase production.

The machine itself also may be equipped with deburring rolls for removing the burr from the edges of heavier gage strip or with cutters for trimming the edge of the strip. When using the machine for cutting strip to cut lengths, a stacking device may be added at the discharge end of the shear.

Procedure for using the machine in the MacKenzie plant consists of placing the coil in the coil box and then use of the pinch rolls feeding the end of the strip into the leveling rolls and on into the stroking head. At this point, the head may be inched forward to carry the strip to the press for the first cut.

The machine then is adjusted to shear pieces to correct length and continuous operation follows until it is desired to change length of the pieces or end of the coil is reached.

The Guide Co. was organized in 1945 by C. R. Gibbons, president, to design and build special machinery and to design and manufacture products such as toys, farm machinery, hardware, etc. Steel mill equipment now being built includes a bead trimmer for a new 22-inch welded pipe mill; a machine for strapping hot coils and a machine for making stove pipe in one operation.

AUTOMATIC FORK TRUCK

DEPENDABLE POWER

EXIDE-IRONCLAD POWER AND BATTERY ELECTRIC TRUCKS

They're saving time and cutting costs on materials handling jobs like yours

More and more companies, with operating conditions that closely parallel yours, have discovered the way to faster, safer and more economical handling of materials. They have given the job of lifting, hauling and stacking to the efficient battery electric truck and equally efficient Exide-Ironclad Batteries.

The high electrical efficiency of Exide-Ironclad Batteries is due largely to the unique construction of the positive plates. Each of these plates consists of a series of slotted, hollow tubes which contain the active material. So fine are these slots that, while they permit easy access of the electrolyte, they prevent the active material from readily washing out. Not only does this add to life of plates . . . and battery . . . it also provides higher power ability and capacity, assuring dependable, day long performance with maximum safety and minimum maintenance.

Write us for a FREE copy of Exide-Ironclad Topics, which contains "Case Studies" of materials handling problems. It tells how to cut handling costs up to 50% . . . covers latest developments in handling materials from receiving to shipping.

THE ELECTRIC STORAGE BATTERY COMPANY
Philadelphia 32
Exide Batteries of Canada, Limited, Toronto

AUTOMATIC TRANSPORTER

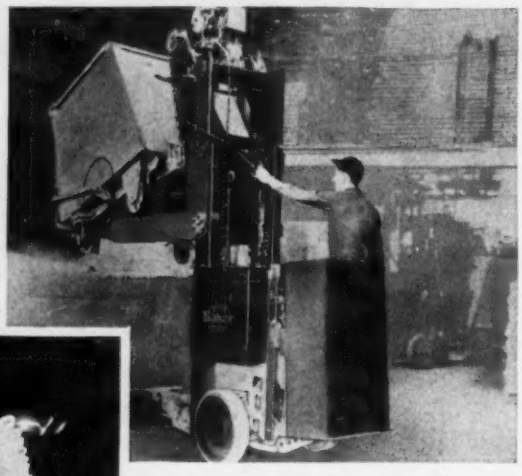
BAKER TRUCK

delivers 35 hours' work in 3!

At the Erie, Pa. plant of a large paper manufacturer it formerly took seven men five hours to unload, weigh and store a box-car load of pulp. Today a Baker Truck *with one operator* can do the job in 3 *hours!*

This Erie plant has a fleet of 24 storage-battery powered industrial trucks in daily operation—with several more on order. Annual production is well over 100,000,000 lbs. of paper, comprising almost 3,000 different kinds, sizes and colors. Trucks are used for unloading and storing incoming raw materials, transporting materials in process, warehousing finished products, and for loading orders for shipment into box-cars. "In all cases" the company states, "sizeable savings were made, not only in handling cost, but also the jobs in which the trucks were used were made many times easier."

Material Handling operations at this plant are controlled by a central department, which integrates all operations and enables the company to utilize its equipment to the best advantage. Where possible, materials are handled in unit loads on pallets or skids. Plans are under way to have all suppliers ship materials on pallets—incoming shipments not now on pallets are palletized at the receiving point. A new warehouse just completed was designed around mechanized unit-load handling with electric-powered trucks and tractor-trailers. The results are a maximum use of warehouse space, a minimum of handling time and cost, and better, faster service for the company's customers.



Substantial savings were made by using a Baker Hy-Lift Truck with special tilt-type platform for charging heaters with pulp.

Baker Fork Truck picking up unit load of lap pulp for loading into box-car.

Let the Baker Material Handling Engineer show you how similar savings are possible in your plant.

Member: Electric Industrial Truck Association

BAKER INDUSTRIAL TRUCK DIVISION
of The Baker-Raulang Company
2167 West 25th Street • Cleveland, Ohio
In Canada:
Railway and Power Engineering Corporation, Limited

Baker INDUSTRIAL TRUCKS

Press-Fit Tolerances

(*Continued from Page* 86)

and assembly, and finally the shipping department at the other end.

Unlike other branches of heavy industry, National had few conversion-to-war problems. Oil seals are oil seals whether installed on trucks or tanks, automobiles or fire-control mechanisms, machine tools or radar antennas, washing machines or field artillery. Similarly, reconversion to peacetime operations evolved few if any problems. In fact, production has increased since V-J Day because war developments uncovered hitherto undreamed of applications for oil seals.

Average oil seal, Fig. 2, made by National has five components. First is the outer case, a pressed steel part, which locks the assembly together permanently. This case is carefully burnished to assure correct press-fit tolerance without loss of shell thickness.

Types of Sealing Members

Second major component is the sealing member itself, made of specially-treated leather or precision-molded Buna-N synthetic rubber. Both the leather and synthetic rubber types are made in single and double-wipe types, tandem and opposed and as dual seals in combination with felt.

Third key component is the tensional spring which exerts exact pressure needed to form optimum contact between the sealing member and the shaft. This spring is wound on automatic but comparatively simple machines developed by the company's own engineers. A small portion of one end of the spring is wound with a smaller diameter than the balance of the spring so that it may be readily screwed into the opposite end to form a complete circle. When mounted in a seal, the spring automatically compensates for wear on the wiping lip.

Fourth component is the steel control washer. Through pressure of the inner case, this washer holds the sealing member tightly against the outer case, thus preventing rotation of the sealing member within the press-fit steel outer case.

Fifth part is the inner case of steel. Like the outer case, it is manufactured to extremely close tolerances. Function of this part is to provide protection for the sealing member and to hold the tensional spring in the correct position.

Off hand, it would not appear that

A HABIT TO JOE...

"NEW IDEA" TO HIS NEPHEW

...YET BOTH WANT THE SECURITY your P.S. Plan Provides

HAVE YOU told all your new or recently hired employees about the benefits of the Payroll Savings Plan for the regular purchase of U. S. Savings Bonds? Wage earners, according to a recent nation-wide survey, want security more than anything else. They prefer security to big pay, soft jobs, authority, "success."

There is no surer way to this peace of mind than systematic savings. And what surer, safer, better means can your employees find than payroll allotments for U. S. Savings Bonds? Bonds that return $4 at maturity for every $3 they invest!

Your active support of the Payroll Savings Plan is an investment in employee contentment, in the citizenship of your community, and in the security of America's future. This is practical "employee relations" of the highest type and pays dividends of satisfaction to everyone.

Start a drive today for larger participation in the plan. Many employees may be unfamiliar with its advantages. If you want literature for distribution, contact your State Director of the Treasury Department's Savings Bonds Division.

New Savings Bonds Plan won't affect the P.S.P.

THE Treasury Department and the banks of America are making it possible for farmers, doctors, and other self-employed people to participate in "automatic" Bond buying by special arrangement with their banks. This extension of the Savings Bonds program is not a partial payment plan and is intended *only* for people who are not in a position to take advantage of the Payroll Savings Plan.

The Treasury Department acknowledges with appreciation the publication of this message by

STEEL

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and The Advertising Council.

The Life of Your Product Hangs by a Thread!

Yes, your product's length of life in consumer service is determined to a large extent by the precision and strength of threads—the threads of screws, bolts, nuts and allied threaded fastenings used in its assembly.

The old adage "a chain is as strong as its weakest link" applies perfectly to the assembly of your product. Obviously, it can be only as strong, precise, efficient and enduring as its fastenings.

HOLTITE Engineered Fastenings are precision-made to resist the loosening effects of vibration. Scientific processing and heat-treating of laboratory-selected materials assure strength far beyond ordinary demands. Under vigilant, skillful supervision these qualities of strength and precision are combined to produce fastenings that effect economies in application and permanance in performance.

The HOLTITE line comprises a complete range of dependable fastenings in all standard styles, sizes, finishes and heat treatments. Furnished with HOLTITE-Phillips Recessed Heads or slotted heads. SPECIALS made to order exact to your specifications, blue prints or samples.

CONTINENTAL SCREW CO. New Bedford, Mass., U.S.A.

oil seals require particularly precise control over dimensions in their manufacture. Actually, the outside diameter must be held to press-fit tolerances, being burnished to plus or minus 0.002-inch. Widths are held within limits of plus or minus 0.015-inch.

Maintenance of these tolerances is made more difficult for the reason that National has found it impossible to purchase steel sheets within plus or minus 0.001-inch of desired thicknesses. Consequently each sheet of steel must be checked for thickness upon arrival and segregated into stacks of known thicknesses, as shown in Fig. 3. Then, compensations can be applied during manufacturing operations so that the parts may be assembled with a snug fit. Operations are further complicated for the reason that seals must be made in numerous diameters ranging from about ⅛ to over 40 inches. Even the maintenance of tools and dies for hundreds of stock items, in sizes from ⅛ to 12 inches is a monumental task.

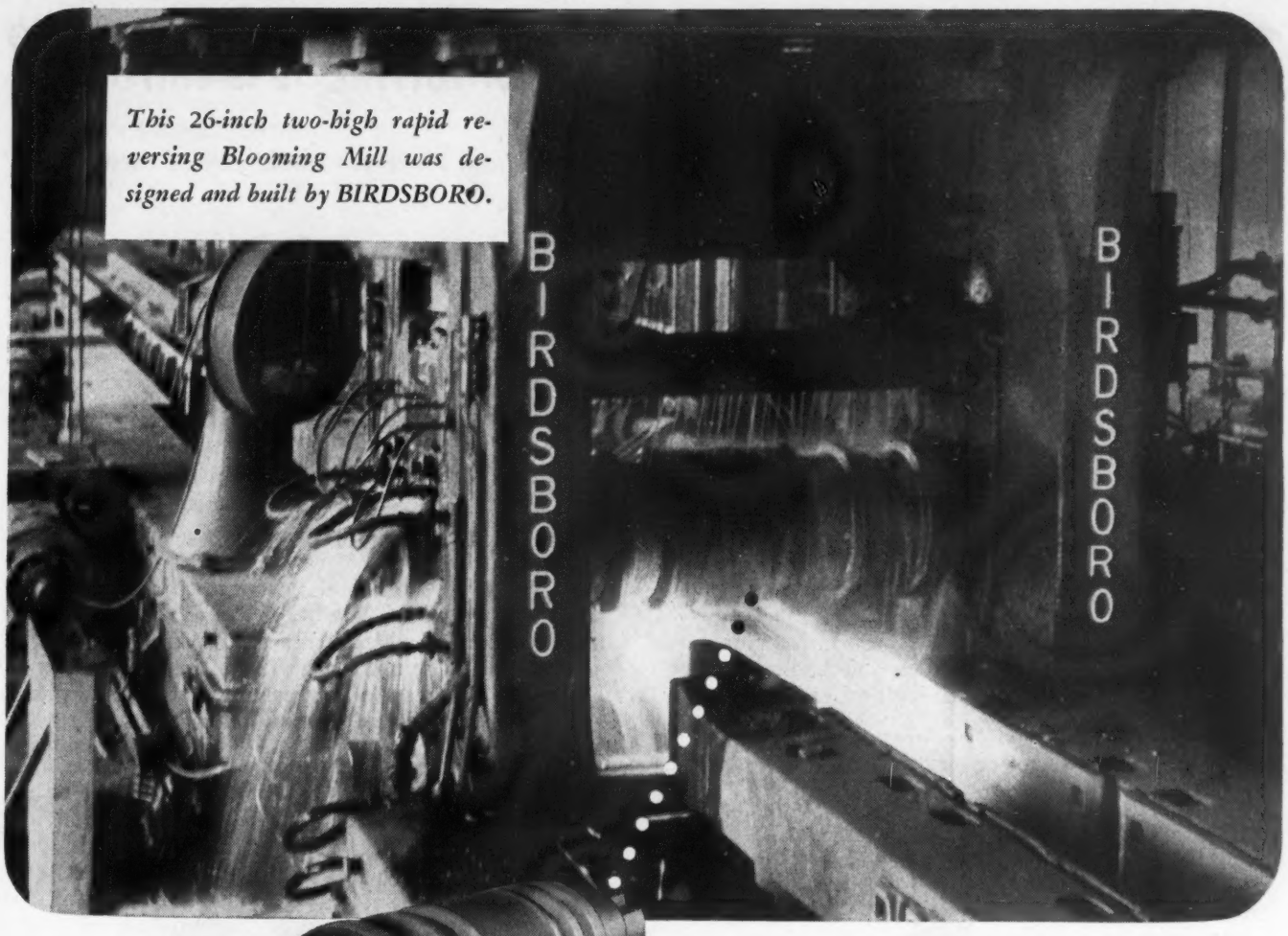
Oil Seals Made From Sheets

A major portion of oil seals are made from 0.030 and 0.050 sheets of deep drawing quality, 36 to 42 inches wide and about 10 feet long. The company also uses a considerable quantity of 0.062 sheets and some 0.020 for very small seals. Usually, it is necessary to specify about one half normal commercial limits.

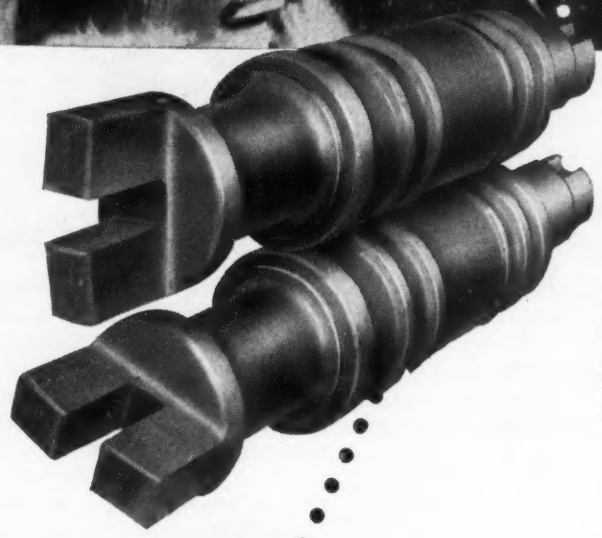
Sheets go from the receiving and sorting department to a slitter, Fig. 4. Widths of the strips cut from the sheet vary with the size of the seals being produced for stock or direct shipment to customers. The strip then goes to a battery of punch presses for blanking and drawing into component parts.

National finds that die design and production are very specialized for the reason that dies must be capable of extremely long runs as well as short runs and must have considerable interchangeability.

It often is necessary to make several inside diameters in seals of a given outside diameter, which calls for close co-ordination of a mass of interchangeable parts. Through the years, National engineers have learned to develop methods which avoid having the cup hang in either the upper or lower part of the dies. Considerable work also has been done with die steel makers to develop steels particularly adaptable to the work. All dies are made in the company's own shop, corner of which is



This 26-inch two-high rapid reversing Blooming Mill was designed and built by BIRDSBORO.



SPECIAL
PATENT PENDING
DIAMONDITE
BIRDSBORO STEEL FOUNDRY & MACHINE COMPANY
BIRDSBORO PA.

BIRDSBORO ROLLS
Keep Rolling For High, Continuous Production

There's less downtime to eat up your profits and increase maintenance costs when Birdsboro "Special A" DIAMONDITE rolls are on the job. They are designed and built for

1. GREATER STRENGTH—to withstand higher mechanical stress.
2. INCREASED HEAT RESISTANCE—to reduce fire-cracking and wear.
3. TIGHTER SURFACE GRAIN—to hold "mirror" finishes longer.

Birdsboro's individualized roll service insures you of rolls with the right combination of analysis and physicals to do your specific job. Our engineers would like to discuss your roll problems with you and work out a practical solution to give you highest roll efficiency at minimum cost.

BUILDERS OF: Rolls, Steel Mill Equipment, Hydraulic Presses, Special Machinery, Crushing Machinery, Steel Castings

Birdsboro Steel Foundry & Machine Co. • Birdsboro, Pa.

BIRDSBORO
ROLLS

Do these false beliefs keep you from converting to aluminum?

(Below are 4 *misstatements* commonly applied to aluminum. Have *you* made any of them?)

1. "Aluminum is not readily adaptable to my product"

Fact: Kaiser Aluminum comes in a wide range of alloys to meet every type of manufacturing operation, and can be formed, drawn, spun, brazed or joined. It can be painted or polished, or finished in almost any way you choose. To select the alloy specifically suited to your requirements, simply call on a Permanente Metals' engineer.

2. "Aluminum costs too much"

Fact: While prices of other materials have steadily risen, aluminum is now *at the lowest price in history.* Figured *not* on a per pound basis, but on *unit cost,* aluminum prices (which include freight charges) compare favorably with those of any other metal or material. In addition, savings made on handling, finishing and shipping cut costs substantially.

3. "My competitors aren't converting. Why should I?"

Fact: Scores of manufacturers are speeding their products to market — by converting to aluminum. That's true of makers of general appliances, residential buildings, air conditioning units, heating and ventilating ducts, garage doors and window frames, office appliances and cabinets . . . *plus dozens more.* Their experience can help *you.*

4. "I can't be sure of a steady, long-term supply"

Fact: This is *especially* wrong *today.* For Permanente Metals now offers you a new source of aluminum . . . Kaiser Aluminum. In but a single year of operation Permanente Metals' mammoth aluminum plants produced 175 million pounds of plate, sheet, and strip aluminum. Almost as much as the entire industry produced in the most productive year before the war.

To the above facts add these . . .

Aluminum's resistance to corrosion cannot be matched. Nor can its strength per pound — it can give you the strength of steel at one-third the weight.

Aluminum's appearance can put an extra sparkle of *saleability* on many products, giving them a competitive edge.

In the light of all these *facts,* can you afford NOT to investigate the possibility of converting to aluminum? Call any Permanente Metals' office and an experienced sales engineer will be on the job, for *you!*

Ready to serve you—today . . . Kaiser Aluminum

a Permanente Metals product

DISTRIBUTED BY PERMANENTE PRODUCTS COMPANY, KAISER BLDG., OAKLAND, CALIFORNIA . . . WITH OFFICES IN:
Seattle, Wash. Oakland, Calif. Los Angeles, Calif. Dallas, Texas Wichita, Kan. Kansas City, Mo. St. Louis, Mo. Atlanta, Ga. Minneapolis, Minn. Milwaukee, Wis. Chicago, Ill. Cincinnati, Ohio Cleveland, Ohio Detroit, Mich. Boston, Mass. Hartford, Conn. Buffalo, N. Y. New York City, N. Y. Philadelphia, Pa. Washington, D. C.

shown in Fig. 7 on p. 87.

Because of the many sizes regularly produced, exceedingly close control over production scheduling is required. To prevent too-frequent die changes and resultant excessive machine down-time, it is the practice to build up banks of components which may be readily drawn on by the assembly department as required. In Fig. 1, dies are shown being changed over for a new run. In Fig. 5, punch press operator is turning out parts for one of the larger-size seals. Note that scrap loss is held down by close spacing and by holding width of strip to minimum required.

In general, the company finds it pays to draw seal members slightly oversize and then size them carefully in final assembly to compensate for variations in steel and in manufacturing. Rejections would run too high, if parts were drawn directly to size in the press department.

Blanking Out Members

Leather sealing members are blanked out on a beam press from selected hides. These blanks then are impregnated with an oil-base material to render them resistant to high temperatures and distortion in service. After shaping to size in hydraulic presses, the sealing members are ready for assembly. Synthetic rubber members are molded and trimmed to size by a subsidiary, the Arrowhead Rubber Co., Vernon, Calif.

Conventional floor truck and tote box handling methods are used in transporting the component parts from the production department to temporary storage and to the assembly department, a section of which is shown in Fig. 6. These parts must, of necessity, be assembled by hand and then are spun into one integral whole.

Spinning is accomplished by sets of rollers which are carefully designed with the proper curve and draft to provide the final curved edge desired. The rollers are mounted on specially built spinners and are controllable as to speed, type, rate of approach, pressure and dwell. The spinning operation makes it possible to compensate for any production errors, as well as to apply the exact pressure required to make a tight closure without undue distortion to the part.

Following the spinning operation, the seals receive the final sizing, usually in tapered dies, and then proceed through the inspection department and finally to the shipping department.

Progress in design is *yours*

Titeflex is keeping pace with the latest designs of machinery and industrial equipment.

TITEFLEX is constantly developing new types of all-metal flexible tubing. Tubing fabricated from brass, monel, stainless steel, and various other metals are available for any application demanding flexibility, high temperature, high pressure, corrosive resistance, tightness, vibration, or downright abuse.

Difficult plumbing and pipe installations are eliminated when Titeflex is specified for the job. Elbows, bends, and fittings that have to be attached to straight lengths of tubing are no longer necessary. A unit in itself, Titeflex is easily installed. A few quick turns on a wrench and the most complicated installation job is accomplished in a few minutes.

Titeflex has a proven record of performance for more than 30 years. Problems of any type installation are invited without obligation.

Titeflex, Inc. 531 Frelinghuysen Ave., Newark 5, N. J.

Exclusive Manufacturers of Titeflex high quality products for more than 30 years

Sales Offices { CHICAGO CLEVELAND DETROIT PHILADELPHIA LOS ANGELES BOSTON SAN FRANCISCO TORONTO

Are Your Assemblies Fastened with Screws?

DETROIT POWER SCREWDRIVERS

Will Eliminate Assembly Bottlenecks

Most Efficient Screw Pick-Up Hopper Ever Designed

Motorized barrel type . . . Will feed screws, nuts, washers, pins and special parts adaptable to hopper. These hoppers can be used on hydraulic or crank presses, riveting machines and special machines. Bracket designed for mounting at any angle. Four sizes: 10, 12, 16 and 24 inch diameters.

●

DETROIT POWER SCREWDRIVERS BRING YOU GREATER EFFICIENCY, SPEED AND ECONOMY

There's a Size to Fit Your Needs

MODEL A drives No. 2 to No. 6 Screws
MODEL B drives No. 6 to ¼" Screws
MODEL C drives ½" to ⅝" dia. Screws

All machines equipped with magazine feed hopper shown above, to feed all types of screws—standard and special heads, Phillips heads, and slotless heads. Driving time 1 to 2 seconds per screw. Uniform tension. No marring of heads. No stripping of threads. Screws are always in sight of the operator.

Send sample assemblies with screws for production estimates and prices on proper equipment for job.

DETROIT POWER SCREWDRIVER CO.

2811 W. Fort Street
DETROIT 16, MICH.

Pigs to Pipe

(Continued from Page 94)

sewage disposal, irrigation, mines, chemicals and paints, creosoting, paper mill, refineries, coke and gas, zinc and lead, packing house, corn products and other pipe line installations. Most of these are produced in the Clow-National foundry, another huge department of the Birmingham enterprise.

The old 104 x 480-ft sand cast pipe shop achieved a great war record, finally becoming third largest producer of 155 mm shells in the country. It is facilitated with one 10-ton and one 7½-ton crane having 60 ft spans. The shop is serviced by 36-in. gage railway throughout. This has now become mold storage.

Molds are procured from National Forge & Ordnance Co., Irvine, Pa., and Titusville Forge Co., Titusville, Pa. All molds are 18 ft long and of 3 to 24-in. diameters. They are delivered at minimum size, ready to go, except that Clow-National has to prepare the bell for whatever type joint is called for in production. There are many types of joints, such as water ball, roll-on, Clow-National bolted, screw-gland, locked, prepoured, sleeve type, flanged, threaded and the standard bell and spigot pipe. Molds have been in somewhat short supply and at times there has been resort to weld repair to make right.

Molds are being ground every day, using carborundum grinders. These travel on home-made grinder cars along a 46-ft bed and have 5 hp motors geared for high speed grinding. Grinder head is on a 20-ft shaft. The pass is the entire length of the mold which is on rollers and rotates 6 to 10 rpm, depending upon mold diameter. The mold is delivered at a minus 0.045-in. minimum and is regularly reworked to get maximum use, being repeatedly ground until it mikes at plus or minus 0.055-in. Average grind takes off approximately 0.005-in. After molds have been ground down to maximum and used to destruction they are sent to the U. S. Pipe and Foundry Co., Burlington, N. J. to be reworked by an unusual squeeze process, really a cold forging method. Clow-National makes ready for this by preparing the ends of the U. S. attachments. Mold cracks are bored out to provide good surface.

By the squeeze process, a mandrel is fitted and capped and the mold is then sealed into a cylinder. Water is pumped into the recess to develop 40,000 psi. Squeeze on the metal is relieved through the cap, the mold actually stretching from the pressure involved. Mandrel is contoured to

Good Gang • ERIE HAMMER • *Good Forgings*

THE Hammergang's experience pays off in full when teamed up with Erie Hammers... Designed for the type of work demanded, ruggedly constructed, with perfect response to operator's control, Erie Hammers have long been the first choice of men who know forgings best... and who know what it takes to make the best forgings. Many Modern Forge Shops are equipped with Erie Steam, Board Drop, Pneumatic, Single or Double Frame Forging Hammers, each one of which definitely applies to the specific forging job to be done. Write for complete descriptive bulletins.

ERIE

ERIE FOUNDRY COMPANY • ERIE, PA.

ERIE BUILDS *Dependable* HAMMERS

pipe diameters, there being a different mandrel for each mold. Mandrels are of solid steel. Clow-National obtains approximately 4000 pipe castings by its own re-work and 1500 additional pipe castings by the squeeze process. Thereafter the mold is scrapped.

Arc Welding Joints

(*Concluded from page* 85)

base material into weld metal.

Preliminary tests were made on ¼-inch material using titanium-coated stainless steel, aluminum bronze, and phosphor-bronze coated electrodes to determine their adaptability to producing sound and nonmagnetic weld seams. All three were found suitable from the standpoint of nonmagnetic qualities. However, welds made with the phosphor-bronze electrode were slightly porous and contained many surface pinholes.

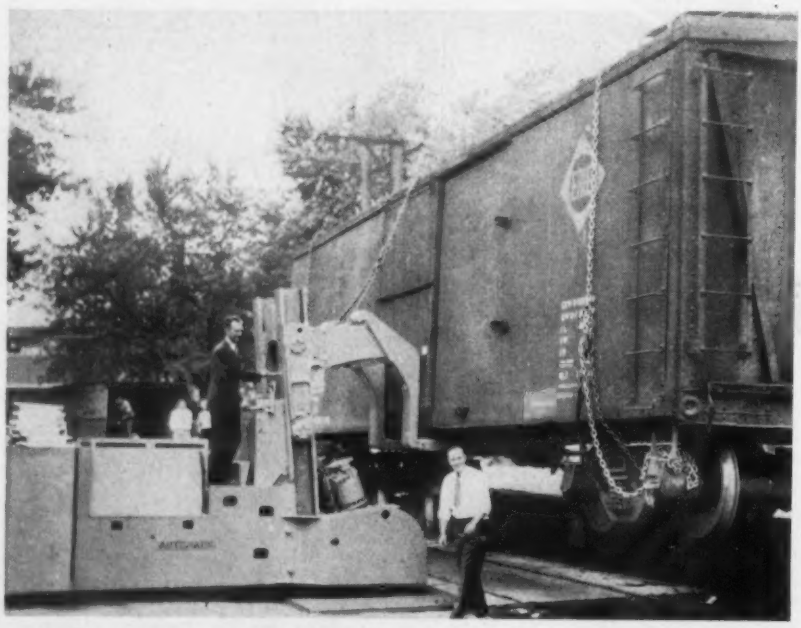
Titanium-coated 18-8 stainless steel electrode was used to make square groove welds on plate thicknesses of 3/16-inch to 3/8-inch, with groove width ranging from ¼-inch to ⅜-inch. A few slag inclusions were noted when the square groove was used on plates greater than ¼-inch thick. A V-groove with a 20-degree bevel per plate was utilized for welding ½-inch and ⅝-inch plate thicknesses. Alternating current and direct current reversed polarity were used, and were found to produce comparable results.

The aluminum bronze electrode was tried with square groove welds. However, a wide groove spacing was required to permit manipulation of the electrode. In order to permit use of minimum groove spacing, a V-groove with a 20-degree bevel per plate was used for all plate thicknesses. Tests were made on ¼-inch mild steel with root spacings of 5/16-inch and ⅜-inch.

Test Welds Made

As the 5/16-inch root spacing sample proved to be magnetic, test welds on ½-inch and ⅝-inch thicknesses were made with root spacings of ⅜-inch. All welds having ⅜-inch root spacing were nonmagnetic. Therefore, tests of intermediate plate thicknesses were not made. This electrode is designed for direct-current reverse polarity only.

Welding procedure used in this investigation is given in the table. Sections were removed from all welded plates, and were machined as per sketch shown in illustration. All-weld metal tip was subsequently tested for magnetism by a strong permanent magnet.



INDUSTRIAL "STRONGMAN": Above 30,000-pound giant industrial truck shown lifting a 46,000-pound freight car to a height over a man's head, is the first of a series of electric fork and ram trucks of 10 to 30-ton capacity, currently being introduced by Automatic Transportation Co., Chicago, for steel mill operations, die-handling and similar functions in automotive and other heavy-industry plants. Reported the first heavy-duty truck with high-pressure lift, the giant materials mover is powered by a 4-wheel front drive assembly, with twin drive units for the two pairs of wheels

Oxygen Enriched Air

(*Concluded from Page* 113)

Hearth Furnaces, by J. M. Brashear, Inland Steel Co., East Chicago, Ind.: No benefits were derived from the use of high temperature steam. Steam temperature in excess of 550 degrees Fahr. is of no value in increasing the flame temperature and the use of higher temperature steam generally results in increased atomizer and burner maintenance.

Results of experimental work conducted on steam-fuel ratios indicate that maximum flame temperatures are obtained using between 2.6 to 3.1 pounds of steam per gallon of oil for tar fired, and 2.9 to 3.3 pounds of steam per gallon of pitch fired. About the same flame temperature can be maintained by reducing steam volume directly as the liquid fuel volume is reduced. The ratios were found to hold for multiple firing to approximately 35 per cent of the total fuel input as coke oven gas.

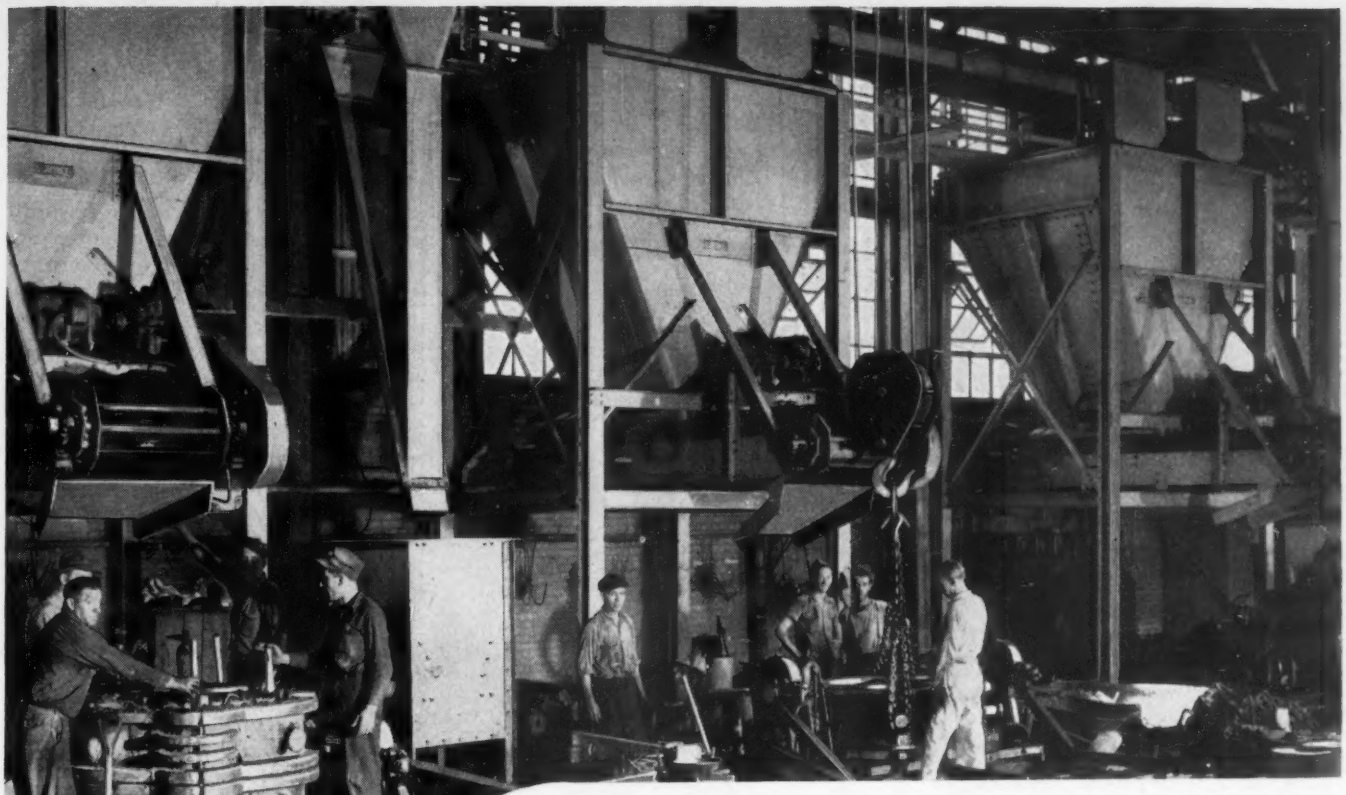
Steam Line Corrosion Inhibitor Offered Again

Morpholine, a volatile compound that inhibits corrosion due to carbon dioxide in steam and condensate-return lines of steam heating or processing systems, is once again available after several years' shortage during the war, according to Carbide & Carbon Chemicals Corp., New York. It is suggested for treating of feedwater for boilers supplying low or medium-pressure steam to heating or processing systems with extensive piping or condensing surfaces.

Carbon dioxide dissolved in condensate water is one of the primary causes of corrosion in steam and condensate-return lines. The compound, an organic chemical alkali, controls acidity due to free carbon dioxide in the feedwater or carbon dioxide resulting from the decomposition of soluble carbonates. It evaporates with water in definite proportions, so that any desired alkaline value in the steam generated can be maintained by adjusting concentration in the boiler.

ALPHA-GAMMA PHASES

In the second section of the article on "Austenitic Manganese Steel", by N. P. Goss, STEEL, Oct. 6, p. 98, top line of lower illustration, Fig. 5, and top lines of other illustrations should indicate gamma phase lines rather than alpha.



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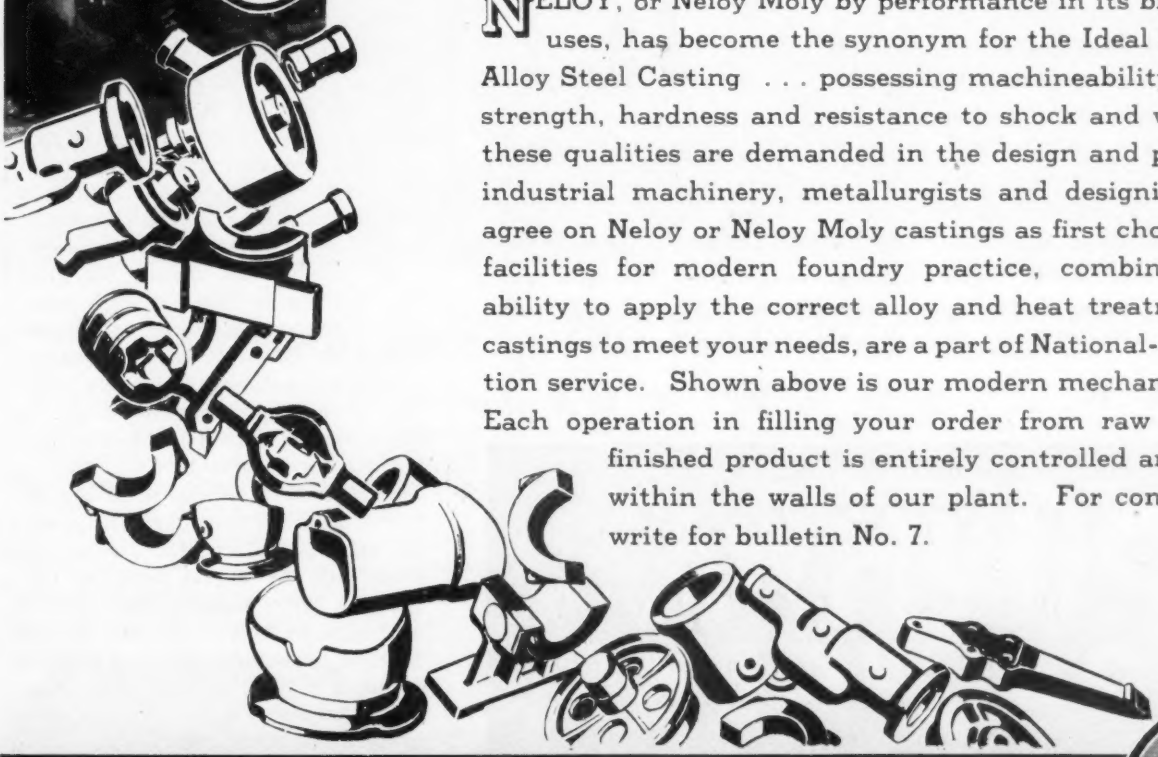

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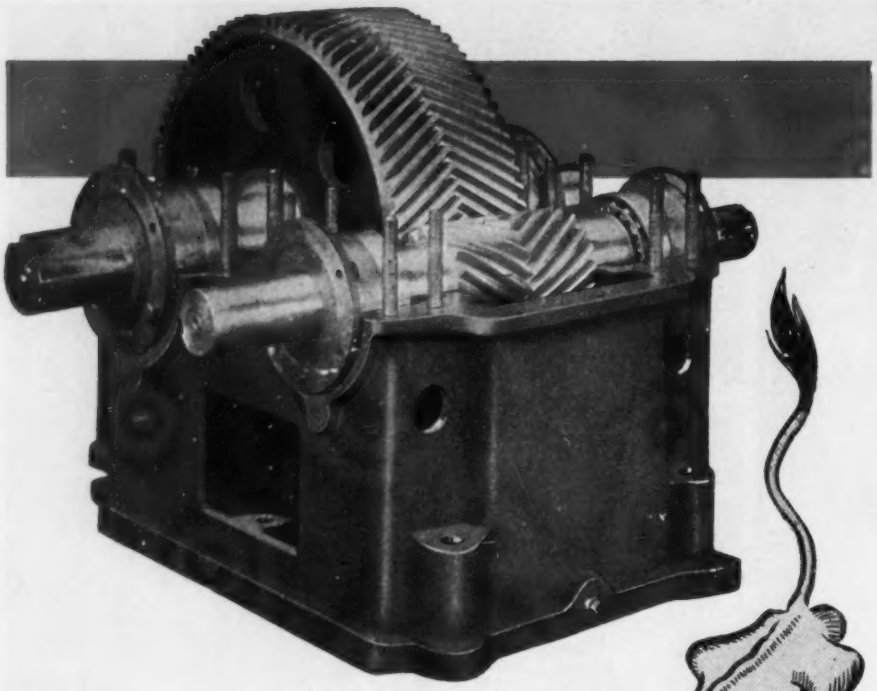

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Corrosion Resistance

(*Continued from Page* 84)

usually rather abruptly bounded on either side by metal in which lamellar pearlite is predominant in the microstructure.

Ringworm corrosion does not always consist of a continuous band of corrosion around the circumference. It may be a series of pits or grooves or may extend only part of the way around the tubing. Fig. 3 shows such a corrosion groove which penetrated the wall of a length of 3-inch tubing in service in the Smackover Field in Arkansas. Although the groove was located in the usual ringworm zone, there was no local corrosion at other points on the circumference. Fig. 4 illustrates some significant factors revealed by examination of this sample. The localized corrosion was found to be almost entirely in the longitudinal groove caused by rubbing of the sucker-rod coupling against the tubing. Wall had been thinned 0.050-inch by intensified corrosion resulting from the rubbing away of corrosion products. This had exposed the main body of the spheroidized carbide zone in the wall, with the result that severe ringworm attack took place at this point. Elsewhere on the circumference, however, a thin layer of predominantly lamellar pearlite structure overlying the spheroidized carbide zone was not penetrated, and no ringworm attack occurred.

This illustration indicates clearly how the carbide structure was the critical factor in this case. It should be noted that the significant feature of the fine-grained structure which previous investigators had shown to bound the ringworm zone on the upset side is not merely its grain size but the lamellar carbide structure. Usually this cannot be detected except at relatively high magnification, and sometimes the lamellar spacing is so close that even an oil-immersion microscope objective does not clearly resolve the structure at 2000 diameters. Hardness of the different zones varies significantly, with the spheroidized carbide zone always exhibiting the lowest and the fine-grained zone usually the highest readings. In this case, the original pearlite structure had a rockwell hardness of B-82, the spheroidized carbide structure B-76 and the fine-grained structure B-85.

Some indication of why the carbide structure should affect the protective properties of the corrosion product film has been discovered through x-ray diffraction analysis and microscopic examination of these products.

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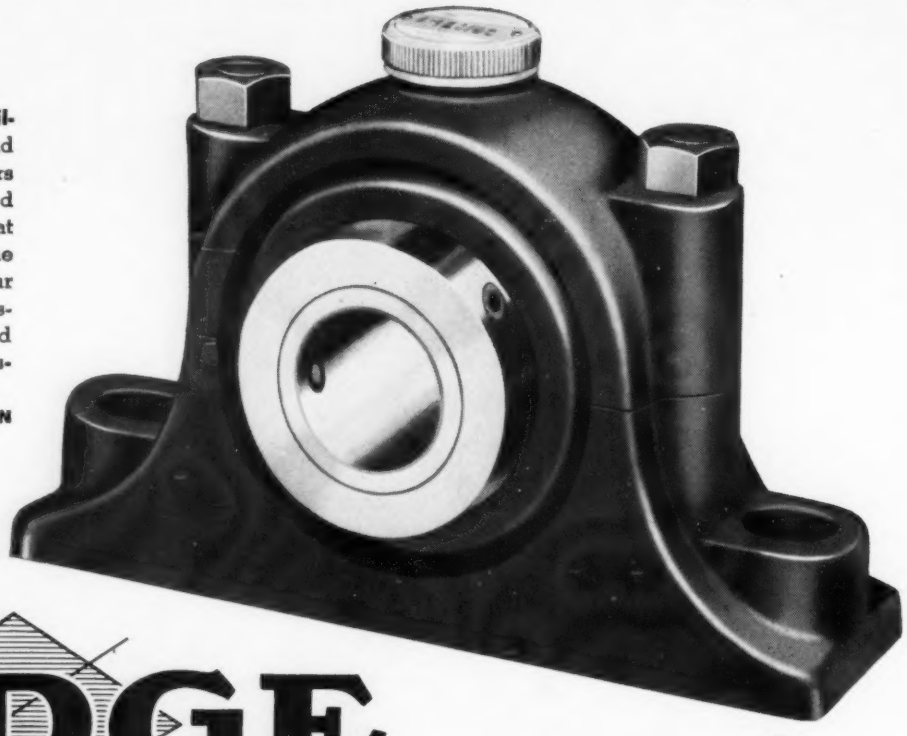

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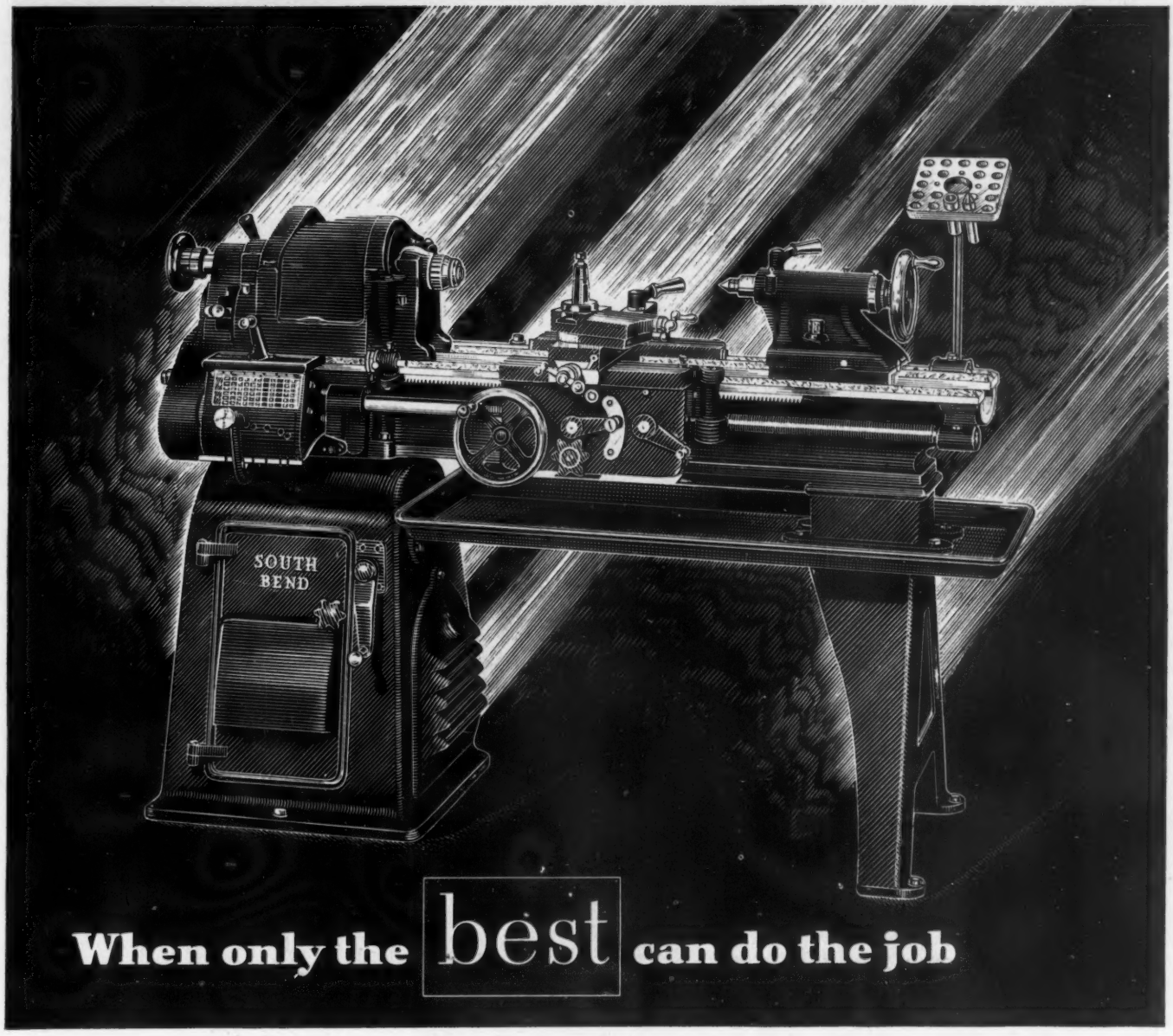

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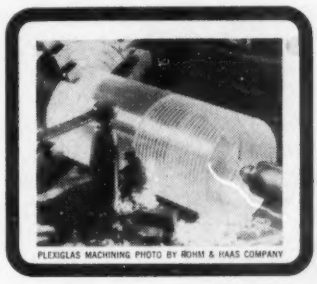
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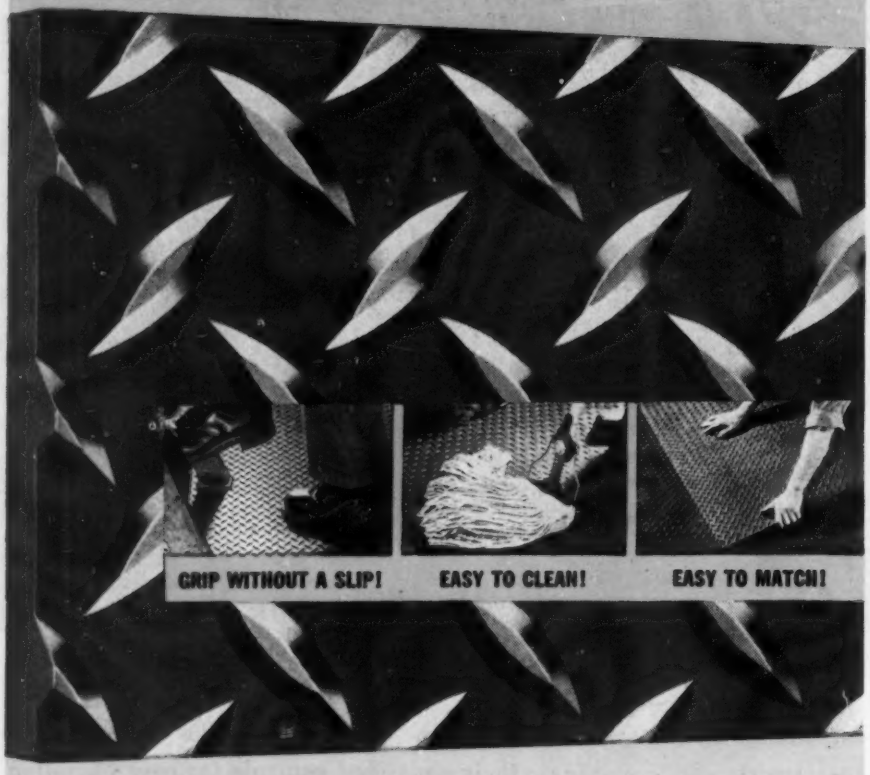

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Holmberg has mentioned fine cementite (Fe_3C), the carbide constituent of steel, in distillate-well corrosion products. Numerous analyses of corrosion products scraped off steel oil-well parts show this substance almost always to be present. In samples from many wells the principal other substance found is iron carbonate ($FeCO_3$). This insoluble carbonate is formed by the action of the carbon dioxide in the gas produced from the well. Corrosion in which the protective nature of the film is critical is typical under these conditions.

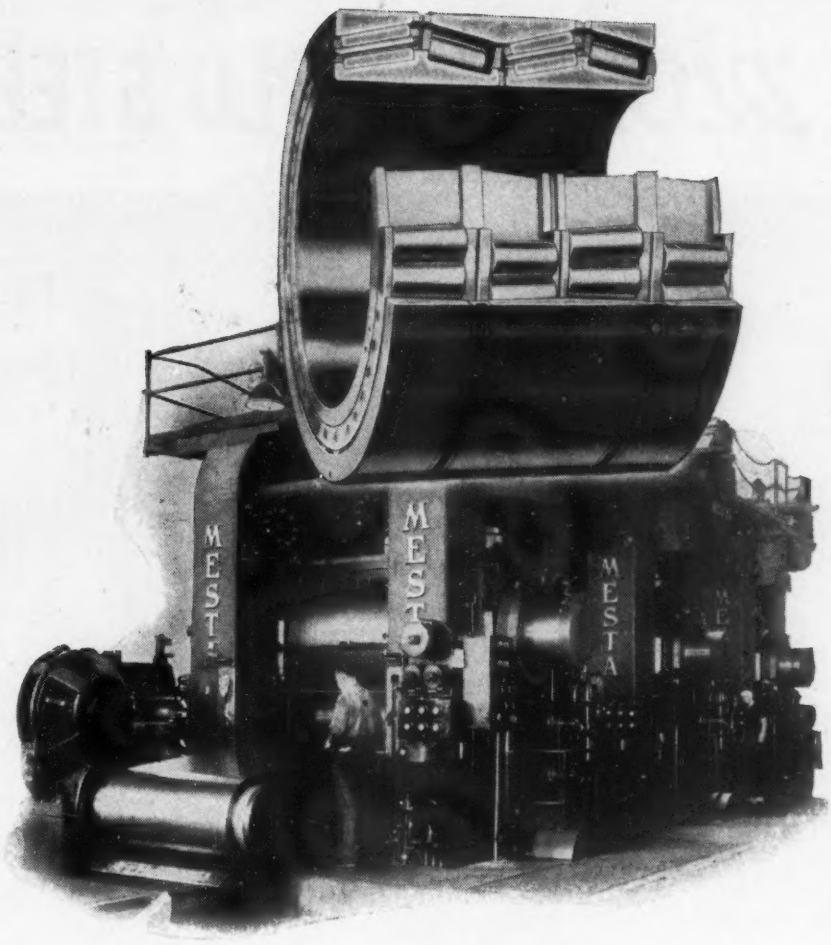
Microscopic examination of the actual structure of this cementite in the corrosion film is made possible by the fact that the film, which usually is somewhat soft when parts are first removed from a well, hardens on drying. Sections of the steel can be cut, mounted, and polished, leaving the film almost intact. It has been found that the unattacked cementite retains its original structure and dimensions in the film.

Fig. 5 illustrates how cementite appeared in a film on the surface of a steel with lamellar pearlite. The original structure is also shown, so that it can be seen how little affected the cementite was by the corrosion attack which completely destroyed the ferrite, or iron phase. Not only the ferrite grains, but also the ferrite between the cementite lamellae was attacked.

Fig. 6 shows results of corrosive attack on a spheroidized carbide structure. The spheroids appear to have been left relatively undisturbed. The spheroidized structure shown was in the ringworm zone of the same tubing in which the lamellar structure of Fig. 5 was found. The ringworm corrosion groove was in this case filled with the product containing spheroidal carbides. This is somewhat unusual, since these corrosion products are usually lost sometime before tubing is pulled from well.

Fig. 1 is a photomicrograph of the cross-section of a corroded steel surface, showing how the ferrite grains have been eaten away on all sides of a pearlite colony which still contains an uncorroded "island" in its center. The edgewise penetration of corrosion between cementite lamellae can be seen. Apparently the corrosion cannot readily penetrate pearlite grains perpendicular to the lamellae. Pearlite grains are made up of colonies of lamellae, each with its own orientation. Those colonies with lamellae oriented more or less parallel to the surface cannot be attacked until the surrounding metal has been eaten away.

Numerous microscopic examinations



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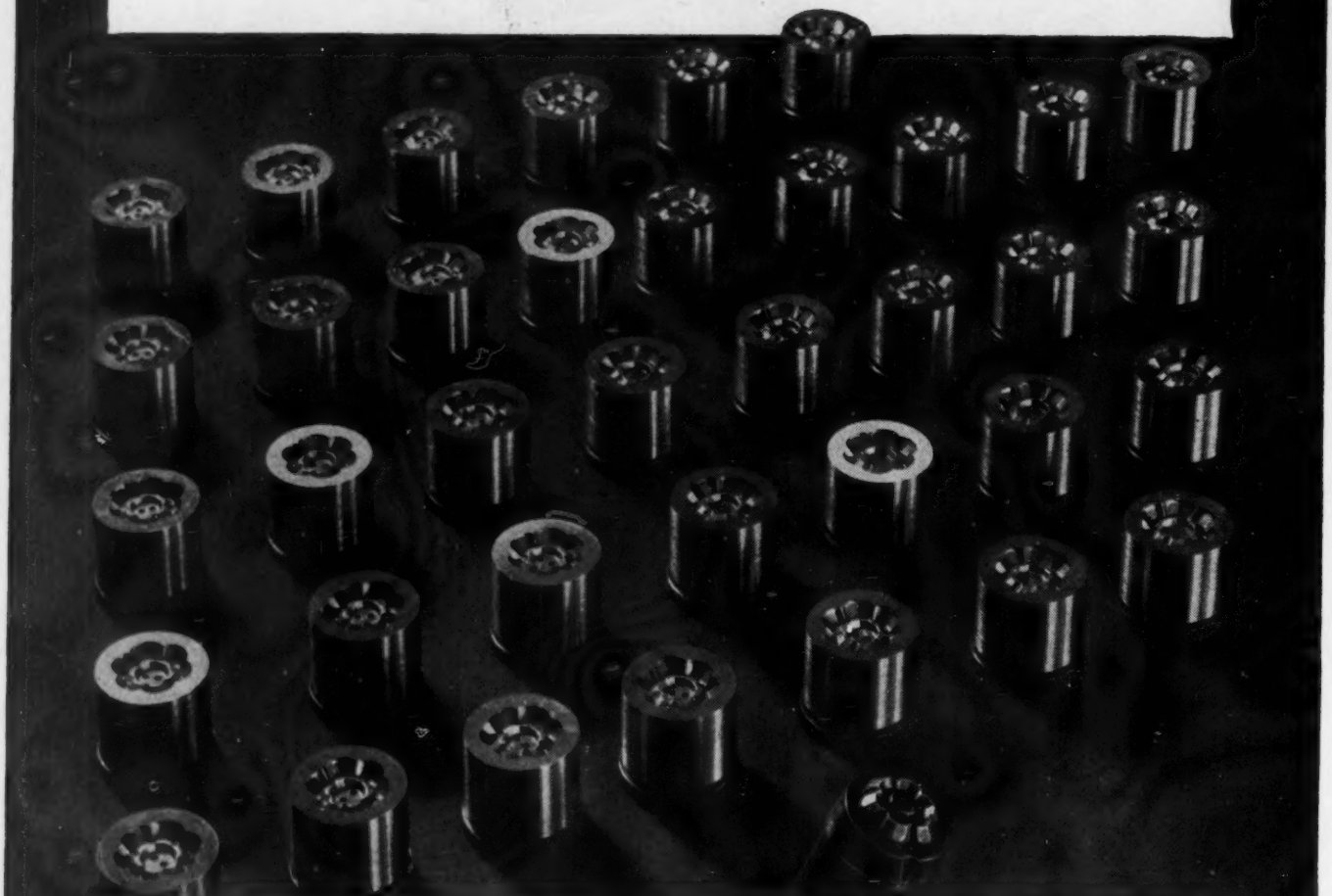

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similar to that illustrated confirm this. This obstruction which the cementite lamellae offer to penetration of corrosion is not in itself enough to account for the critical differences in corrosion rate observed, but it seems to be connected with the way in which carbide structure affects the protectiveness of the corrosion film.

Localized corrosion of steel similar to ringworm attack in oil-well service is produced in the laboratory by several methods, all of which have in common the formation of some kind of insoluble film on the surface.

One method used consists of boiling in ammonium nitrate-ammonium chloride solutions. On steel, this forms a black Fe_3O_4 film, which is less protective on spheroidized carbide structure than on lamellar pearlite. Another method consists of exposing the steel to sulphuric-nitric acid mixtures similar in composition to spent nitrating acid. A third consists of corroding the steel in copper salt solutions.

A method which gives rapid and somewhat reproducible results employs a solution made up with sodium dichromate, concentrated sulphuric acid, and water in proportions of 1 gram to 2 milliliters to 4 milliliters, respectively. At room temperature this mixture does not violently attack steel, but at 175° F and above, steel with a spheroidized carbide structure may be attacked at drastic rates corresponding to a penetration of as much as 1/8-inch per hour. (Caution! Considerable heat is evolved).

Pearlitic structures are not so violently attacked. Initial attack forms a film on the surface, containing precipitated iron and trivalent chromium compounds. Fig. 2 shows a sample of "ringworm" produced with this solution. Piece of tubing shown had a ringworm zone, as indicated by the localized corrosion on the inside. This occurred in service. The external evidence of this ringworm was the crack and the small hole shown. Exposure to the test solution produced a corroded ring around the outside.

Fig. 7 is an illustration of how the spheroidized carbide structure in steel is inherently more susceptible to attack than pearlite in film-forming corrosion. All three specimens were cut out of the same 5/8-inch round steel bar and all were originally 1/4-inch thick. This fine-grained medium manganese steel with 1.28 per cent manganese, 0.37 per cent carbon, 0.19 per cent nickel contained no significant amounts of

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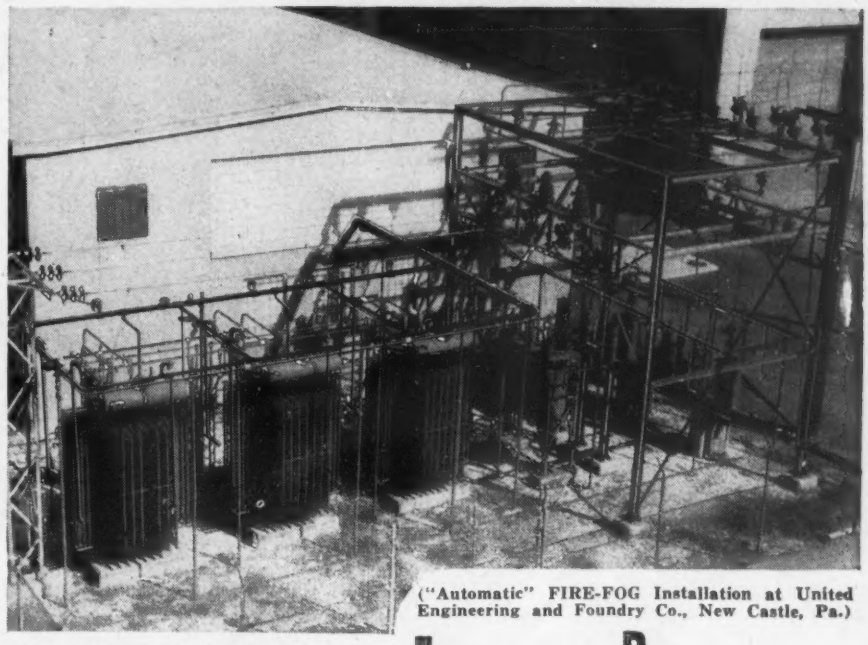

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other alloying elements. One sample was normalized from 1600° F and another was spheroidized at 1300° F for 5 hours. Both were then simultaneously exposed to the dichromate-sulphuric acid solution at approximately 180° F for 1/2-hour. They are shown in the figure with the third unexposed specimen.

As can be seen, the spheroidized sample was well on the way to being completely destroyed, while the normalized sample was only slightly attacked. Similar spheroidized samples were completely destroyed in a little more than 1 hour, while normalized samples suffered only 0.020-inch penetration in the same time. The pearlite in these normalized samples consisted of very closely-spaced lamellae.

Carbide structure is significant not only in ringworm corrosion of upset tubing, but in other cases of oil well corrosion. Recently the flow line of a distillate well in a Gulf Coast field was dismantled and the corrosion in pipe and fittings studied in considerable detail. Most of the corrosion was localized. In every case carbide structure of the steel appeared to be the most critical factor determining corrosion rate.

Several fittings with quenched-and-tempered structures were corroded severely. Steels were types 1045, 4140 and 9430. The depth of corrosion could not be correlated with composition very well, but a connection with structure could readily be detected. The greater the extent of tempering (i.e., the more coalescence of carbides into discrete spheroids), the greater the severity of corrosion. In some of these fittings, however, the pattern of corrosion also appeared to have been affected somewhat by other factors, such as impingement of well fluid on certain surfaces and perhaps partial wetting of surfaces by water in the fluid.

A cast valve body and a cast ell which both had been corroded severely were found to have microstructures which would ordinarily be called pearlitic. Pearlite in the valve body consisted, however, of relatively short broken-up lamellae. The ell had very coarse grains with a network of ferrite around the pearlite and some Widmanstatten structure of the ferrite. The pearlite, when viewed at high magnification, was seen to consist largely of spheroids and considerably deformed and broken-up lamellae. Only a few small colonies of well-formed lamellae were to be found in any one of the large pearlite grains.

The carbon steel pipe in the flow line had suffered less general corrosion than the fittings, but in and near the welds and in certain lengths of pipe local attack had occurred. Limits of the locally corroded areas near the welds were readily correlated with changes in hardness and carbide structure of the steel. Fig. 8 shows a weld in a straight section of the line, with intensified attack on both sides of the weld and especially severe attack on the weld metal itself. Pipe on the left contained 0.25 per cent carbon, 0.60 per cent manganese, and 0.028 per cent sulphur; pipe on the right, 0.21 per cent carbon, 0.53 per cent manganese and 0.029 per cent sulphur. Weld metal was a low-carbon iron. Fig. 9 shows carbide structures associated with this localized corrosion.

Area of intensified attack corresponded to the heat-affected zone around the weld. Metal in the zone was generally several points lower in rockwell B hardness. Limits of localized corrosion were determined in this case, however, not by change to an extensively spheroidized carbide structure, but merely the change to a structure in which the pearlite

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"HI-CARBS"
Heat Treated Black Satin Finish

Made of high carbon steel—AISI C-1038. Furnished with black satin finish due to heat treatment. Hexagon heads die-made, not machined. Point machine turned; flat and chamfered. Tensile strength 130,000-160,000 p.s.i. Carried in stock.

FILLISTER CAP SCREWS

Heads completely machined top and bottom. Milled slots—less burrs. Flat and chamfered machine point. Carried in stock.

FLAT HEAD CAP SCREWS

Heads completely machined top and bottom. Milled slots—less burrs. Flat and chamfered machine point. Carried in stock.

SET SCREWS

Square head and headless—cup and oval point—case hardened. Carried in stock.

"SHINYLAND" STUDS

All studs made steam-tight on tap end unless otherwise specified, with flat and chamfered point. Nut end, oval point. Carried in stock.

"SHINYTHREADS"
AIRCRAFT ENGINE STUDS

Made of highest aircraft quality alloy steel, finished to extremely close thread and body tolerance, with precision rolled threads—both straight and step types.

CONNECTING ROD BOLTS

Made of alloy steel—heat treated—threads rolled or cut—finished to extremely close thread and body tolerances—body ground where specified.

SPRING BOLTS

Case hardened to proper depth and ground to close tolerances. Thread end annealed. Supplied in various head shapes, with oil holes and grooves of different kinds, and flats accurately milled.

VALVE TAPPET ADJUSTING SCREWS

Hexagon head style—to blueprint specifications—hexagon head hard; polished if specified—threads soft to close tolerance.

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SPECIALS furnished to **BLUE PRINT SPECIFICATIONS**

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showed the first signs of being affected by heat. Lamellae of this affected pearlite were distorted but only a few spheroids had formed. Near the weld there was some fine-grained recrystallized metal, but the pearlite structure was not very well defined.

There were a number of welded bends in this line, all of which were locally corroded. There was a slight tendency for the attack to be more severe on the outside of the bends, apparently as a result of impingement of the fluid. Primary critical factor, however, was found in every case to be carbide structure of steel.

Fig. 9 shows a cross-section of the surface at edge of locally corroded area magnified 1500 diameters. The unattacked cementite in the corrosion film can be seen projecting up from the pearlite in what seems to be a fairly continuous network. Possibly this is another clue to the mechanism by which carbide structure affects protectiveness of the film.

Carbon content of the various sections of the line varied from 0.12 to 0.25 per cent carbon. There was some tendency for the lower carbon steel to corrode more readily; but even on the 0.12 per cent carbon steel, a protective film had formed on most of the surface. One section of pipe had suffered from extensive attack. For over three-fourths of its length, this pipe had been corroded uniformly to a depth of 0.10-inch. At the end shown, however, a film of corrosion products had apparently protected much of the surface. Local failure of this film had led to pitting; but, significantly, these pits were only 0.10-inch deep.

This fact would seem to indicate that there was no important galvanic action involved in the pitting, since the attack was no more intense than where the film had failed generally. Carbide structure of the steel consisted throughout this length of pipe of a poorly formed pearlite. Some peculiarity of the thermal history of the pipe must have accounted for such a structure. X-ray diffraction analysis of film on the protected areas showed Fe_3O_4 to be present, in addition to the $FeCO_3$ and Fe_3C found in films on other parts in this flow line. Possibly the presence of some original mill scale led to the formation of a protective film, but once damaged, the film was not self-healing.

In the case of some alloy steels, differences in corrosion rate are difficult to correlate with carbide structure, because of limitations of the ordinary metallographic methods and of the optical microscope. Fig. 10 shows microstructures of normalized N-80 tubing and of the spheroidized material in the ringworm zone of the same tubing. In N-80 tubing, a yield strength of 80,000 pounds per square inch is obtained by various low alloy additions. There was a marked difference in corrosion resistance of the two structures shown. The resemblance of the spheroidized structure to that observed in carbon steel can be seen; but the normalized structure, while different from the spheroidized, does not resemble pearlite in carbon steel very much. It is possible that the electron miscroscope might show up significant features of the carbide structure not revealed in these photomicrographs.

Effect of carbide structure of normalized low-alloy steels needs more study. There are indications that alloying elements may sometimes impair corrosion resistance by producing a deformed lamellar pearlite structure.

In summary, much field experience indicates that the carbide structure of steel profoundly affects the corrosion resistance under conditions in which solid corrosion products form on the surface. Apparently, the unattacked cementite somehow affects the protectiveness of the other solids present. Whether this is some kind of anchoring action of the lamellae or a reinforcing action in the film itself is not clear. In any case, well-formed pearlite with lamellae which appear in a photomicrograph to be fairly long, straight, and continuous are definitely beneficial. Spheroidization of the pearlite removes this beneficial effect. Distortion of the lamellar pearlite structure by heating subsequent to its formation is detrimental. Alloying elements which affect the lamellar structure may also sometimes be harmful. In quenched-and-tempered structures the corrosion resistance becomes less, the greater the degree of tempering.

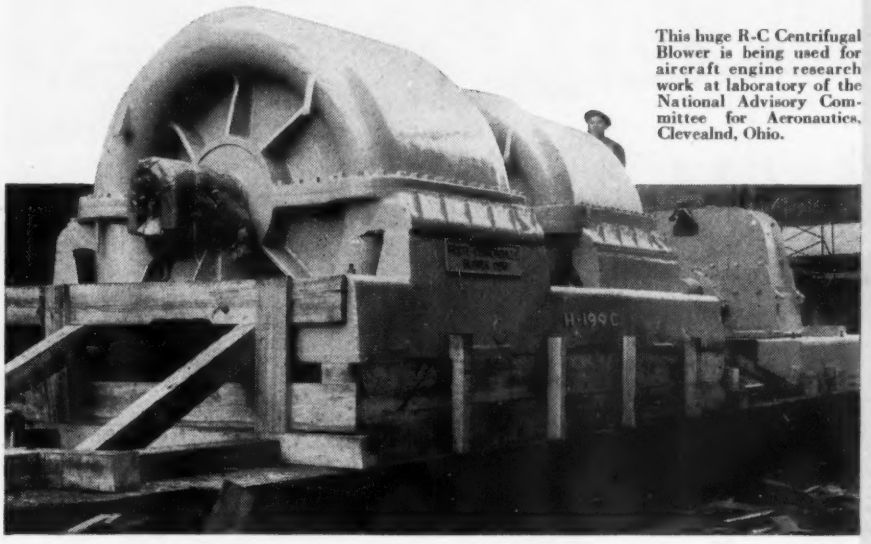
The whole problem of carbide structure has been given too little attention in evaluating the corrosion resistance of steels. Re-examination of past corrosion experience may indicate that in some cases this factor could have explained phenomena dismissed as vagaries of corrosion. In future studies of the corrosion of steel, especially in oil-well service, it should be given careful attention.

REFERENCES

1. Holmberg, M. E., "Some Metallurgical Observations with Respect to Corrosion in Distillate Wells". *Corrosion*, 2, 278-285 (1946) Nov.
2. Prange, F. A., "The Agents, Basic Causes, Control and Prevention of Corrosion". *Oil and Gas Journal*, 45, 18, (1946) Sept. 7. Ibid No. 19, 88-90 (1946) Sept. 14.
3. Wescott, B. B., *Science of Petroleum*. I, 491-493 (1946).
4. Private files of Phillips Petroleum Co., Metallurgical Examination reports.

From *Corrosion*, based on paper presented at 1947 annual meeting of NACE, Chicago.

Freight car loaded with WIND



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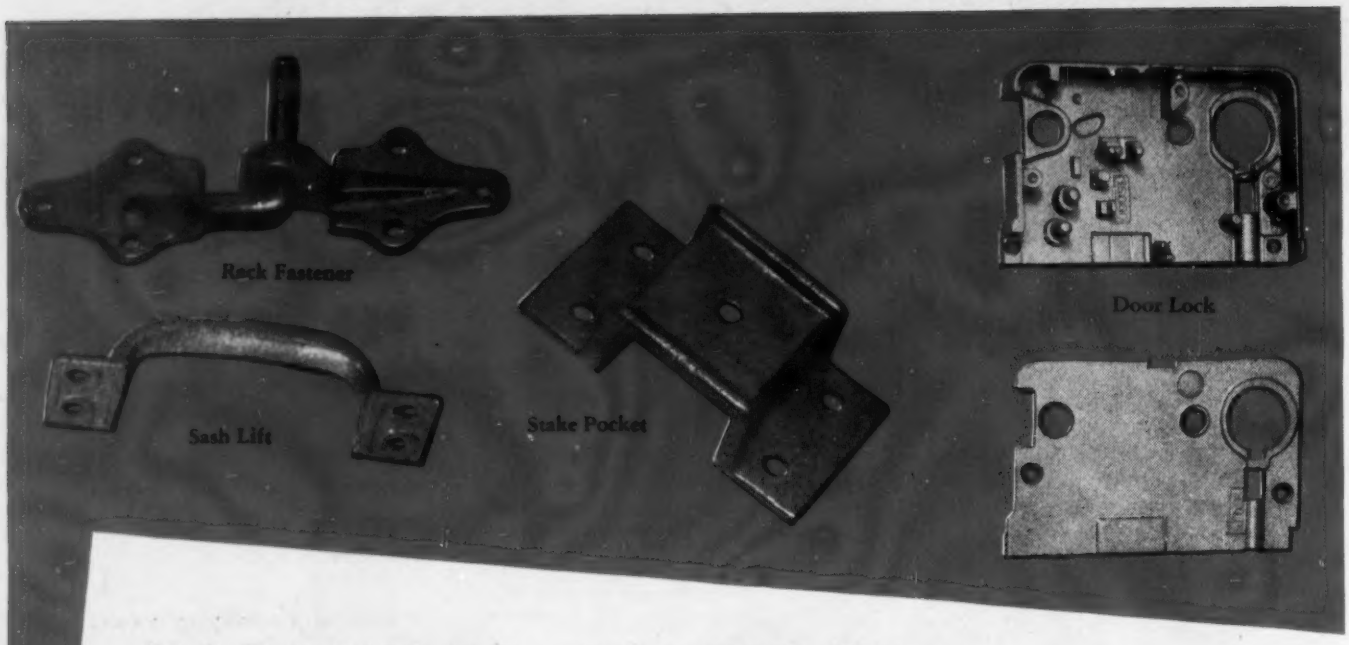

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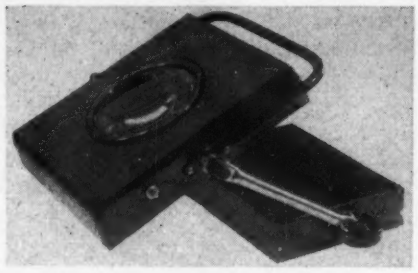
New Products and Equipment

Additional information on the new products and equipment described on this and succeeding pages may be obtained, without obligation, by checking appropriate numbers on the cards following page 144

1. Fluorescent Magnifier

Fluorescent lighted, a new fully portable magnifier with double-convex 5-in. diameter lens is offered by Larrimore Sales Co., P. O. Box 1234, St. Louis 1, Mo. It is made in a single lens model for continuous use, having a large field of vision, or in a double lens model for intermittent

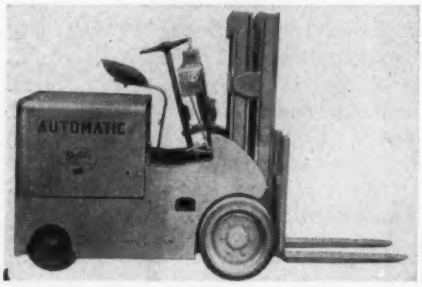


use with a moderate size field of vision. Greatest magnification is obtained with the latter model.

Indirect lighting is by two 6 w, 9-in. daylight fluorescent tubes. Operation is from a 115 v, 60 cycle alternating current. It is equipped with a carrying handle and a weighted base. Lens holder section may be tilted through a full 360 degrees.

2. Fork Lift Truck

Capable of tiering to truck and trailer ceiling as low as 68 in. and yet offering a total lift of 100 in., the new fork lift truck announced by Automatic Transportation Co., 149 West 87th St., Chicago, Ill., is



available in capacities of 2000, 3000 and 4000 lb. It is a modification of the company's Skylift telescopic, tilting, hydraulic electric fork truck.

Forks of truck will lift to 52 in. before the telescopic action begins to increase the overall height. A "dead man control" and ease of mounting and dismounting are other features. Truck is designed to be operated in a manner similar to an automobile. Its Newmatic controller operates as the counterpart of the gearshift automatically eliminating tire slippage and making possible even acceleration.

3. Metal Melting Furnace

Johnson Gas Appliance Co., Cedar Rapids, Iowa, announces model No. 1019 industrial metal melting furnace designed for melting lead, tin, zinc, pot metal, type metal, aluminum, etc. It is equipped with nine burners, each with separate valve and pilot

light, this arrangement permitting use of as many burners as needed.

Capacity is 1000 lb of lead and pot temperatures up to 1400° F may be obtained. Furnace is heavily insulated to reduce heat loss. It has a removable cast iron pot with lifting hooks and may be furnished with automatic temperature controls.

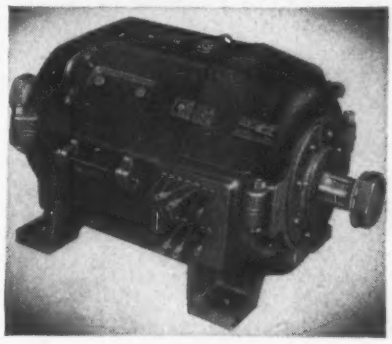
4. Eccentricity Gage

An electronic eccentricity gage for testing welding rods during the extruding process before or after baking is announced by Moslo Machinery Co., 2443 Prospect avenue, Cleveland 15. It uses a balanced circuit in which one rod is used for balancing, the other for measurement, both being taken from the same batch. Meter shows eccentricity in 0.001-in. increments.

5. Mill Motors

New line of mill motors reduced one frame size through larger and more efficient armature which fits within the limiting dimensions of the motor frame, new roller bearings and bearing housing and redesigned field coils, is announced by Westinghouse Electric Corp., P. O. Box 2025, Buffalo 5, N. Y.

Heavy duty type MC motors are of totally enclosed, protected self-ventilated or protected force-ventilated construction. Built in accordance with AISE standardized di-

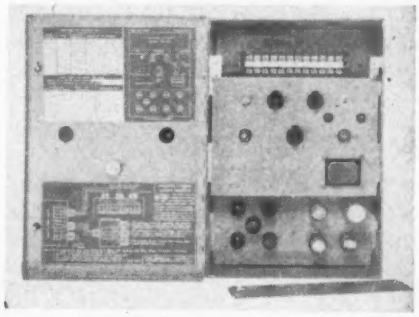


mensions, they incorporate: Split frame of cast steel; silicone insulated armature coil conductors; wedges of class B material to hold coils in slots; and rigid mounting of brush holders.

Motors are offered in sizes from 5 to 200 hp, in voltages of 230 and 550 and in AISE dimensions frames 602 to 618.

6. Overload Control

An electronic device for use in conjunction with an electric motor driven machine to "trip" at any preset mechanical load increase above normal is the Protectron, manufactured by Brinnell Co., Granby,



Conn. Instantaneous in action, sensitive to minute overloads and adjustable to any degree of overload with practical limits, the device is automatically compensated for fluctuations in terminal voltage.

When the instrument trips, a red-

warning light is illuminated and a relay is energized to stop the motor, stop the machine by operating clutch or brake, increase or decrease voltage on motor, sound warning signal, etc., using auxiliary equipment. It senses slightly over-sized stock, pile-ups, dull punches and other causes before damage occurs, protecting tools and dies.

Device is available for 220/440 volt 60 cycle motors for operating current of 1 to 5 and 5 to 10 amperes.

7. Lift Truck Accessory

A revolving carriage, designed for handling solid, liquid or granular bulk materials which require movement from one container to another, is a new accessory for fork lift trucks, made by Towmotor Corp., 1226 East 152nd St., Cleveland 10, O. Carriage revolves in a 360 degree

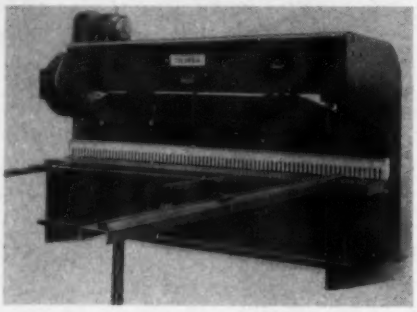
circle in either direction, power being supplied by a hydraulic motor through a chain drive.

Operation is controlled by a valve located near the lift truck operator. A container mounted on the truck forks may be turned 180 degrees to provide complete dumping in approximately 5 sec. Installation of the accessory does not affect normal operation of the fork lift trucks.

8. Squaring Shears

Tearing and nicking when notching or trimming sheets longer than the blades of the new squaring shears, made by Columbia Machinery & Engineering Corp., Hamilton, O., are eliminated by longer shear blades which provide an opening on one end equal to the maximum thickness of the material. No adjustment is necessary to change the manner of shearing.

All principal members such as housing, base, table, slide, top cross die, etc., are fabricated of rolled steel plate to provide high strength, maximum rigidity and accuracy. An easily read stainless steel scale is mounted in the shear table and each machine has a mechanically operated auto-



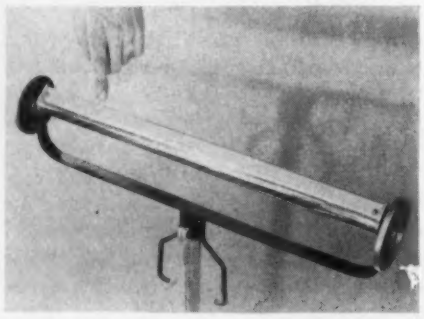
matic hold down. Standard throat depth is 18 in. The 6-ft model will shear 1/4-in. mild steel at 60 strokes per minute. Ten and 12-ft models will shear 3/16-in. mild steel at the same speed. Machines are furnished for belt or individual motor drive.

9. Tubular Dust Collector

Made from a permanent mold aluminum casting, a tubular type dust collector, made by Aerotec Corp. and Thermix Corp., Greenwich, Conn., has an exceptionally high efficiency because of increased centrifugal forces. Small diameter and flush outlets permit closer spacing of tubes. It also serves as the fly ash eliminator between combustor and turbine in latest developments in locomotive gas turbines.

10. Wheel Mounted Magnet

Pick-up of ferrous dust, chips, shavings and other material from finishing department floors is possible with the wheel mounted 18-inch floor magnet developed by G. H. Tennant Co.,

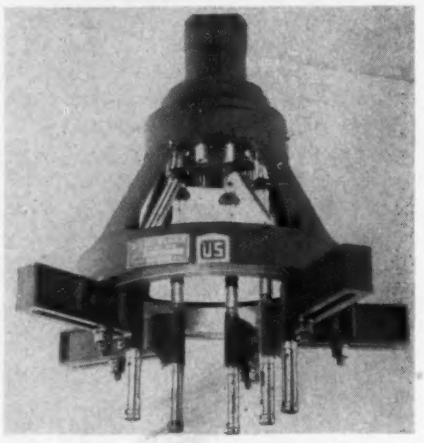


2530 North Second St., Minneapolis 11, Minn. Built for one hand operation, the unit contains nine large Alnico magnets encased in a seamless aluminum tube. Its 3 1/2-inch diameter aluminum wheels allow rolling under low benches, machines, around dip tanks, etc.

Advantages: Contamination of porcelain or enamel surfaces is reduced; safety conditions are improved; floor maintenance is simplified; and recovery of ferrous assembly parts is made easier. Magnet is equipped with detachable 4-foot handle and steel keeper plate. It may be fastened to the back of any standard Tennant floor machine, if desired.

11. Drill Head

Two to 10 spindles, each capable of drilling a 1/2-in. diameter hole in cast iron can be furnished with a No. 1 Morse taper on the adjustable multiple spindle universal joint drill head manufactured by U. S. Drill Head Co., 616 Burns St., Cincinnati 4, O. Spindles are mounted in Oilite bushings and heavy duty ball thrust



bearings are used for tool thrust. Use of No. 2 Morse taper spindles increases capacity to 3/4-in. cast iron.

Spindles with No. 1 taper may be adjusted to any hole pattern within a 10-in. diameter circle with minimum center distance between any two spindles of 7/8-in. With No. 2 taper spindles drilling area is 9 3/4-in. and minimum center distance is 1 3/8-in.

12. Rubbish Incinerator

An air cooled incinerator erected in four standard sizes to meet the requirements of almost any plant is the rubbish Destructor designed by Plibrico Jointless Firebrick Co., 1800 Kingsbury street, Chicago 14. Engineered for the rapid burning of dry rubbish and readily combustible material, its design includes an auxiliary drying hearth for disposing of moderate amounts of wet refuse.

Lining of combustion chamber and stack is air cooled, the cooling current entering through ports at the base of the walls. This increases life of refractory lining and also preserves

exterior brickwork from excessive cracking. Lining of incinerators is of castable refractory which, when mixed with water on the job and poured into forms, hardens to concrete-like hardness without heat. Sizes are designated by capacity in cubic yards of dry rubbish consumed per 8 hours of operation: 10, 20, 40 and 60 yd.

13. Furnace Heat Controller

An electronic pyrometer controller for electronic heat control of furnaces, melting pots, kilns or any heating device using electricity, gas or oil, is announced by Illinois Testing Laboratories Inc., 420 North LaSalle St., Chicago 10, Ill.

Pyrometer movement is double pivoted on jewelled bearings. Its 6-in. mirrored scale is easy to read and its case is dust tight and weather proof. A ruby "eye" indicates on and off conditions of heat supply.

14. Metal Electrode

Designed to simplify the welding of light gage mild steel, a new No. 13 electrode, announced by Hobart Bros Co., Troy, O., may be used with direct current straight polarity or alternating current. Low penetration, ease of handling and steady uniform transfer of metal contribute to make it fast for out-of-position welding. It is available in 1/16, 5/64, 3/32 and 1/8-in. diameters.

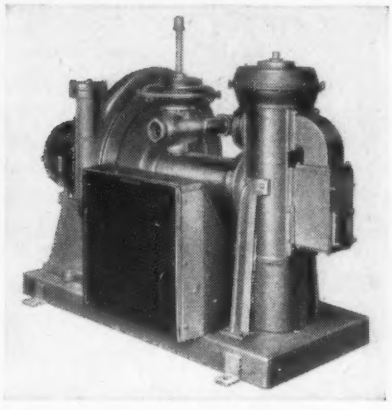
15. Pipe Fittings

Pipe fittings suitable for use with chemical and all fluid processes which have corrosion and turbulence problems are available in Inconel, nickel, Monel, and stainless steel 304, 316 and 347, from Northern Indiana Brass Co., Elkhart, Ind. They are die formed from the identical tube specified, hence match perfectly. A new lock ring presents a simple method of joining with silver brazing or soft solder.

16. Cone Type Diluter

An adjustable compensator mechanism on the McKee cone type diluter, made by Eclipse Fuel Engineering Co., 718 South Main St., Rockford, Ill., enables the operator to make a richer mixture by opening the adjustable slides, thus permitting a portion of the gas to by-pass the gas cone when it is used in industrial plants and for gas manufacturing. Amount of by-pass gas can be either changed over the entire range or adjusted at any point in the operating range.

For large capacities, filters are of replaceable glass fiber-felt airmat; for low capacities, filter media consist of metal fibers coated with oil and mounted in a circular metal housing from 8 to 16 in. in diameter. The diluter is actually an assembly of several units, designed to work together to accomplish completely reliable automatic operation in mixing gas with air or in mixing any two gases. Mixture resulting is not only properly proportioned and mixed but is also delivered at the pressure required by that application.



17. Fanning Strip

An improvement in terminal wiring is announced by Howard B. Jones Division of Cinch Mfg. Corp., 2460 West George street, Chicago 18, in the fanning strip which facilitates multiple wiring to barrier terminal strips. From one to 20 wires from the cable lead-in may be securely anchored to proper terminals and quickly soldered.

Connections may be made anywhere apart from the mounted barrier strip and the entire assembly slipped into place in the barrier strip in a few seconds. Only remaining operation is tightening of terminal screws. Brass terminals are cadmium plated and riveted to bakelite mounting base. Fanning strip is for use with Jones barrier terminal strips No. 141 and 142 which provide for 1 to 20 and 1 to 17 contacts respectively.

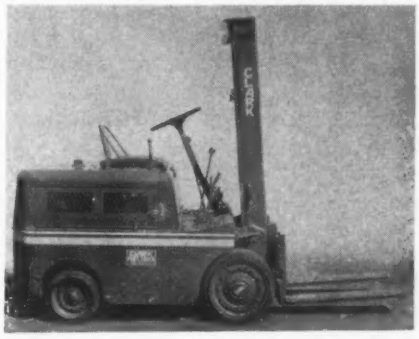
18. Lubrication System

For conveyors operating through high temperatures, such as through ovens, a new type of lubrication system has been developed by J. N. Fauver Co., 49 West Hancock, Detroit 1. These automatic lubricators have reduced horsepower needed to drive conveyors and assure more efficient operation,

Each lubrication unit is mounted on top of the beam which carries conveyor wheels and automatically lubricates the wheel bearings from each side of the two wheels above each hanger. Unit also is equipped with a manifold containing 11 nozzles which lubricate all link pins between hanger trolleys.

19. Fork Truck

Maximum lift of 120 in. with an overall height of 83 in. with forks lowered is a feature of the fork lift truck, the Carloader, announced by Clark Tructractor Division of Clark Equipment Co., 258 West Champion St., Battle Creek, Mich. Driver comfort is achieved by a spring upholstered, adjustable seat with backrest, a slanting floorboard which makes controls more accessible and easier to operate and a steering gear bracket mounted on truck frame to eliminate transmission of vibration to the driver.



Hydraulic valve is mounted on the sump, eliminating pipes and fittings and possibility of leaks. A mechanical governor maintains proper uniform speed and a water pump maintains constant temperature. Motor is accessible through large side louvers.

Gasoline powered trucks are produced in three capacities: No. 3015, 3000 lb at 15 in.; No. 4015, 4000 lb at 15 in.; and No. 4024, 4000 lb at 24 in. or 5000 lb at 16 in. Battery powered models are the same except for No. 2015. Standard lift is 120 in. for all capacities, with a low lift model of 72 in. and an extra-high lift model of 144 in.

20. Hydraulic Arbor Press

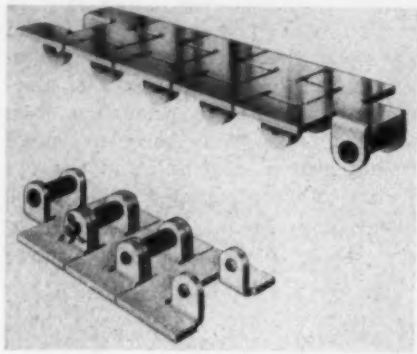
With pressure controlled by a foot pump which leaves the hands free to handle and position the work, a new 10-ton hydraulic arbor press, made by Air Hydraulics Inc., 401 Broadway, New York 13, N. Y., has a press housing of cast steel, accurately machined. Each stroke of the fast-speed center pedal moves the ram ⅞-inch down to the work. Right pedal or power pump moves it down 1/16-in. with each stroke. Ram is returned by pressing left pedal.

Platen of press is of machine steel with a precision ground surface suitable for mounting dies. Foot pump block is of Meehanite metal and pump base and pedals are of cast semi-steel. Pressures up to 20,000 lb may be delivered.

21. Conveyor Chain

Flat top conveyor chain for use in handling various items through cleaning, filing, and other operations is a development of Wade-Morrison Co., 18401 Shaker Blvd., Cleveland, O. Each link of the chain is the same. Top plate, which is the carrying surface, also acts as the side bar of the link, minimizing the number of parts.

All parts are manufactured to close tolerances and top surface is ground after assembly, insuring a smooth surface. Chain is available in 1½-in. pitch and in any width of top plate from 3 to 7½-in. It is offered in carbon steel with pins and bushings carburized and hardened or in type 304-18-8 stainless steel with alloy pins and bushings hardened. The chain will operate over No. 60 extended pitch sprockets or over extra width sprockets designed for use with this chain.

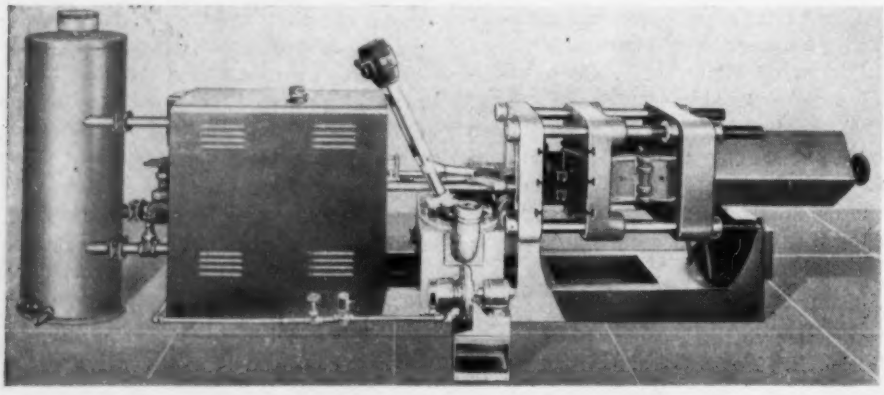


22. Die Casting Unit

Convertible from normal cold chamber operation to optional hot chamber operation, the model HD-302 heavy duty hydraulically operated die casting machine, announced by H. L. Harvill Mfg. Co., Corona, Calif., is capable of as many as 300 shots per hour. As a cold chamber machine, it will cast aluminum, magnesium and copper base alloys, as well as lead, tin and zinc alloys. These alloys are hand ladled by the operator from a furnace adjacent to the machine.

Metal is injected into die cavities under pressure ranging from 3400 to 11,800 psi. Pressure on metal is controlled by piston size which is related to volume of metal required to fill die cavities. With maximum diameter piston (3 3/4-in.) the lowest injection pressure is realized. Machine is capable of casting up to 11.6 lb of aluminum alloy, or an equivalent volume of other materials.

Conversion to hot chamber operation is by installation of a self contained conversion unit. With this unit the machine (illustrated) can be changed over in less than 30 min. Zinc, tin and lead alloys may be cast by the hot chamber method.



23. Tachometer Mount

Pedestal mounts of type 66 are available from Metron Instrument Co., 432 Lincoln street, Denver 9, for use with type 52 Metron tachometers where rotating speed for full scale reading is between 100 and 10,000 rpm. Head is mounted on the upright column, adjustable in the base to obtain alignment. Rotation of head on vertical axis and adjustment up and down is possible. Heights up to 4 ft are practical.

24. Bus Duct

Adaptability to a virtually limitless range of power distribution problems, Noark bus duct, manufactured by Cole Electric Products Division of Federal Electric Products Co., 50 Paris street, Newark 5, is housed in a sheet metal enclosure which has insulated plug-in openings which assure safety in applying and removing plug-in devices. Such openings are on 12-in. centers. Duct is manufactured in 10 ft sections.

25. Screwdriver

Light is focused directly upon the screw head using the flashlight-screwdriver introduced by Graham Mfg. Co., Detroit 9. One hand holds the screwdriver and focuses the light, freeing the other hand. Battery and bulb are encased in the plastic handle. An interchangeable feature makes it possible to accommodate a variety of small attachments, such as various sized screwdriver blades, Phillips and other special driver blades and socket wrenches.

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Freight Rate Increase To Be Reflected in Steel Cost

Mill base prices expected to hold unchanged for time being but delivered prices to consumers are being marked up. New show of strength developing in scrap with steelmaking grades up $2 to $3 per ton in East. Acute pig iron shortage forcing foundries to curtail

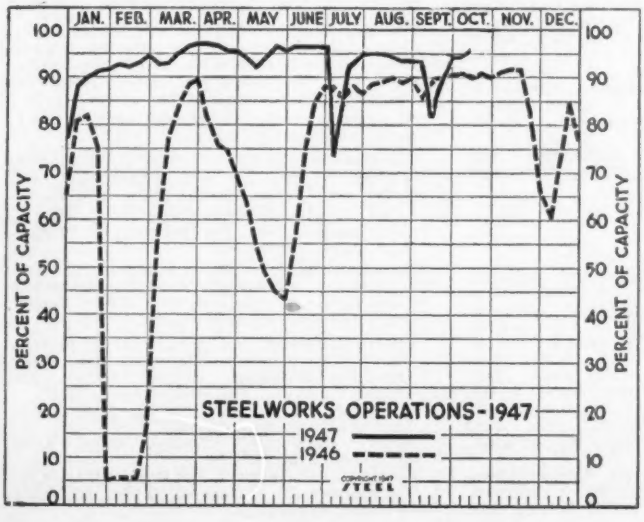
INFLATIONARY spiral in the iron and steel markets received another sharp twist last week when the Interstate Commerce Commission approved a temporary overall freight rate increase of 8.9 per cent. At the same time scrap showed new signs of strength with prices up $2 to $3 per ton in the East.

The new freight rate schedule becomes effective Oct. 13, and while no early change in steel mill base prices is indicated, steel buyers nevertheless will promptly feel the effects of the higher tariff since delivered prices will be immediately affected.

Direct mill shipments will reflect the advanced rates in higher delivered prices since it is unlikely producers will absorb any additional freight under present market conditions. Consumers, also, will have to pay more for tonnage received from warehouses. However, warehouses at some points are reported planning to absorb at least part of the freight rate boost by basing their prices to consumers on the carload rather than less-carload rates as has been custom in the past. This may result in a savings to consumers of as much as 20 cents per hundredweight.

The new freight rate schedule applies to all iron and steel products, and, in fact, to commodities in general, except for certain products including iron ore, coal and coke. Rates on these latter are being increased on a flat cents per ton basis, with ore up 10 cents, barring certain important hauls, and coal and coke up 10 cents a net ton.

As it is too early to fully appraise the burden of this latest freight rate increase on costs, steel producers may not revise their base prices for some time. Ultimate action may depend largely upon other inflationary factors, and the combination of them all as a whole. It was suggested last week that insofar as the freight factor is concerned steel mill base prices may not be affected until the ICC acts on the railroads' original request for a permanent general increase of 26.8 per cent in rates.



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Oct. 11	Change	Same Week 1946	Same Week 1945
Pittsburgh	102.5	+ 1	97.5	62
Chicago	95	+ 0.5	91	86
Eastern Pa.	91.5	None	81	75
Youngstown	92	None	90	50
Wheeling	93.5	+12	86	88
Cleveland	92.5	+ 2	91	79
Buffalo	88.5	None	90.5	86
Birmingham	99	None	99	95
New England	84	+ 4	92	82
Cincinnati	87	None	84	77
St. Louis	80	+ 2.5	72.5	68
Detroit	88	— 6	60	84
Estimated national rate	95.5	+ 1	90	73.5

Based on weekly steelmaking capacity of 1,749,928 net tons for 1947; 1,762,381 net tons for 1946; 1,831,636 tons for 1945.

Demand for steel products continues heavy and far in excess of supply with respect to most items. Consumers of sheets, strip, plates, pipe, small and medium sized carbon bars and shapes see no early improvement in supply in sight.

Definitely stronger tone is developing in scrap. In the East the market has burst wide open at the seams with steelmaking grades up $2 to 3 per ton on heavy demand and other grades, including cast, also quoted higher.

Approach of winter, when tighter supply conditions are anticipated, largely explains the new show of strength in scrap. This scarcity of scrap, coupled with acute shortage of pig iron, presents a threat to future sustained high steel production. Shortage of merchant pig iron is causing foundries to curtail operations.

National steel ingot rate rose 1 point last week to 95.5 per cent of capacity, highest since last June. Detroit district operations dropped 6 points to 88 per cent due to furnace repairs. Operations increased 1 point to 102.5 per cent in Pittsburgh, 12 points to 93.5 per cent in Wheeling, 4 points to 84 per cent in New England, 2½ points to 80 per cent in St. Louis, 2 points to 92.5 per cent in Cleveland, and ½ point to 95 per cent in Chicago.

A sharp advance in scrap in the East lifted STEEL's composite price average on steelmaking scrap to $38.75 from $37.92 for the previous week and $37.83 for September. Other composite market averages held unchanged at $75.41 for finished steel, $56.80 for semifinished steel and $36.13 for steelmaking pig iron.

COMPOSITE MARKET AVERAGES

	Oct. 11	Oct. 4	Sept. 27	One Month Ago Sept., 1947	Three Month Ago July, 1947	One Year Ago Oct., 1946	Five Years Ago Oct., 1942
Finished Steel	$75.41	$75.41	$75.41	$75.41	$70.80	$64.45	$56.73
Semifinished Steel	56.80	56.80	56.80	56.80	53.04	40.60	36.09
Steelmaking Pig Iron	36.13	36.13	36.13	36.14	33.82	27.50	23.00
Steelmaking Scrap	38.75	37.92	37.83	37.83	37.23	19.17	19.17

Finished Steel Composite:—Average of industry-wide prices on sheets, strips, bars, plates, shapes, wire, nails, tin plate, standard and line pipe. **Semifinished Steel Composite:**—Average of industry-wide prices on billets, slabs, sheet bars, skelp and wire rods. **Steelmaking Pig Iron Composite:**—Average of basic pig iron prices at Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Neville Island, Granite City and Youngstown. **Steelworks Scrap Composite:**—Average of No. 1 heavy melting steel prices at Pittsburgh, Chicago and eastern Pennsylvania. Finished steel, net tons; others, gross tons.

COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

Finished material (except tin plate) and wire rods, cents per lb; coke, dollars per net ton; others, dollars per gross ton.

Finished Materials

	Oct. 11, 1947	Sept., 1947	July, 1947	Oct. 1946
Steel bars, Pittsburgh	2.90c	2.90c	2.66c	2.50c
Steel bars, Philadelphia	3.28	3.28	2.98	2.86
Steel bars, Chicago	2.90	2.90	2.66	2.50
Shapes, Pittsburgh	2.80	2.80	2.56	2.35
Shapes, Philadelphia	2.94	2.94	2.64	2.48
Shapes, Chicago	2.80	2.80	2.56	2.35
Plates, Pittsburgh	2.95	2.95	2.71	2.50
Plates, Philadelphia	3.15	3.15	2.85	2.558
Plates, Chicago	2.95	2.95	2.71	2.50
Sheets, hot-rolled, Pittsburgh	2.80	2.80	2.56	2.425
Sheets, cold-rolled, Pittsburgh	3.55	3.55	3.27	3.275
Sheets, No. 10 galv., Pittsburgh	3.90	3.90	3.63	†4.05
Sheets, hot-rolled, Gary	2.80	2.80	2.56	2.425
Sheets, cold-rolled, Gary	3.55	3.55	3.27	3.275
Sheets, No. 10 galv., Gary	3.90	3.90	3.63	†4.05
Strip, hot-rolled, Pittsburgh	2.80	2.80	2.56	2.45
Strip, cold-rolled, Pittsburgh	3.55	3.55	3.27	3.05
Bright basic, bess. wire, Pittsburgh	3.675	3.675	3.475	3.05
Wire nails, Pittsburgh	4.25	4.25	3.975	3.75
Tin plate, per base box, Pittsburgh	$5.75	$5.75	$5.75	*$5.25

* Nominal. † Base, No. 24 gage.

Semifinished Material

Sheet bars, Pittsburgh, Chicago	$60.00	$60.00	$53.20	$38.00
Slabs, Pittsburgh, Chicago	47.50	47.50	43.60	39.00
Rerolling billets, Pittsburgh	47.50	47.50	43.60	39.00
Wire rod $\frac{7}{32}$ to $\frac{1}{4}$-inch, Pitts.	2.925c	2.925c	2.63c	‡2.30c

‡ Base, No. 5 to $\frac{5}{16}$-in.

Pig Iron

	Oct. 11, 1947	Sept., 1947	July, 1947	Oct. 1946
Bessemer, del. Pittsburgh	$37.83	$37.83	$36.03	$29.77
Basic, Valley	36.00	36.00	34.20	28.00
Basic, eastern del. Philadelphia	38.72	38.72	36.47	29.93
No. 2 fdry., del. Pgh. N. & S. sides	37.33	37.33	35.53	29.27
No. 2 fdry., del. Philadelphia	39.22	39.22	36.97	30.43
No. 2 foundry, Chicago	36.00	36.00	34.20	28.50
No. 2 foundry, Valley	36.50	36.50	34.70	28.50
Southern No. 2, Birmingham	34.88	34.88	31.98	24.88
Southern No. 2, del. Cincinnati	39.75	39.75	36.85	28.94
Malleable, Valley	36.50	36.50	34.70	28.50
Malleable, Chicago	36.50	36.50	34.70	28.50
Charcoal, low phos., fob Lyles, Tenn.	44.00	44.00	43.00	33.00
Ferromanganese, fob cars, Pittsburgh	151.00	140.25	140.25	140.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$38.00	$38.00	$37.20	$20.00
Heavy melt. steel, No. 2, E. Pa.	39.50	36.75	38.06	18.75
Heavy melt. steel, No. 1, Chicago	38.75	38.75	35.95	18.75
Heavy melt. steel, No. 1, Valley	40.50	39.50	37.35	20.00
Heavy melt. steel, No. 1, Cleveland	38.25	38.25	37.65	19.50
Heavy melt. steel, No. 1, Buffalo	39.50	39.00	37.90	19.25
Rails for rerolling, Chicago	46.25	46.25	43.20	22.25
No. 1 cast, Chicago	43.50	43.50	41.10	25.00

Coke

Connellsville, beehive furnace	$12.00	$12.00	$11.20	$8.75
Connellsville, beehive foundry	14.50	14.50	13.05	9.50
Chicago, oven foundry, del.	18.50	18.50	17.46	15.10

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per gross ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants. Delivered prices do not include the 3 per cent federal tax on freight.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, price negotiated, fob mill. Forging quality $46, Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown.

Alloy Steel Ingots: Pittsburgh, $56.

Rerolling Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $45-$50, sales by smaller interests on negotiated basis at $65 or higher.

Forging Quality, Billets, Blooms, Slabs: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Birmingham, Youngstown, $55-$58; Detroit, del., $61; eastern Mich., $62.

Alloy Billets, Slabs, Blooms: Pittsburgh, Chicago, Buffalo, Bethlehem, Canton, Massillon, $66, del. Detroit $69, eastern Mich., $70.

Sheet Bars: Pittsburgh, Chicago, Cleveland, Buffalo, Canton, Sparrows Point, Youngstown, $60; sales by smaller interests on negotiated basis at $66 or higher.

Skelp: Pittsburgh, Sparrows Point, Youngstown, Coatesville, 2.60c-2.65c per lb.

Tube Rounds: Pittsburgh, Chicago, Gary, Cleveland, $69.

Wire Rods: Pittsburgh, Chicago, Birmingham, $\frac{7}{32}$ to $\frac{1}{4}$-in., inclusive $2.80-3.05 per 100 lb. Galveston base, $2.95. Worcester, 2.90c. San Francisco (base del.), $3.52.

Bars

Hot-Rolled Carbon Bars and Bar-Size Shapes under 3-in.: Pittsburgh, Youngstown, Chicago, Gary, Cleveland, Buffalo, Birmingham, Duluth, base, 20 tons one size, 2.90c; Detroit, del., 3.05c; eastern Mich., 3.10c; New York, del., 3.31c; Phila., del., 3.28c; San Francisco (base, del), 3.63-3.95c; Los Angeles (base, del.), 3.625-3.86c; Seattle, 3.58c, base.

Rail Steel Bars: Same basing points as merchant carbon bars, except base is 10 tons. Prices upon application.

Hot-Rolled Alloy Bars: Pittsburgh, Youngstown, Chicago, Canton, Massillon, Buffalo, Bethlehem, base 20 tons one size, 3.30c; Detroit, del., 3.45c; eastern Mich., 3.50c. (Texas Steel Co. uses Chicago base price as maximum fob Fort Worth, Tex., price on sales outside Texas, Oklahoma.)

Cold-Finished Carbon Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, base 20,000-39,999 lb., 3.55c; Detroit, del., 3.70c; Toledo, 3.75c.

Cold-Finished Alloy Bars: Pittsburgh, Chicago, Gary, Cleveland, Buffalo, Canton, base, 4.10c; Detroit, del., 4.25c; eastern Mich., 4.30c.

Reinforcing Bars (New Billet): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Sparrows Point, Buffalo, Youngstown, base, 2.75c; San Francisco (base, del.), 3.33c; Los Angeles (base, del), 3.325c; Seattle, 3.88c, base.

Reinforcing Bars (Rail Steel): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Buffalo. Prices upon application.

Iron Bars: Single refined, Pittsburgh 7.15c-†7.70c; double refined, 8.00-†9.75c; Pittsburgh, staybolt, 8.85c-†11.25c.

† Hand puddled.

Sheets

Hot-Rolled Sheets (18 gage and heavier): Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Buffalo, Youngstown, Sparrows Point, Ashland, Ky., base, 2.80c; Granite City, 3.175c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; Philadelphia, del., 3.00c; New York, del., 3.09c; Los Angeles (base, del), 3.54c; San Francisco, (base, del.), 3.545c. (Andrews Steel Co. quotes Middletown, O., base for shipment to Detroit. Alan Wood Steel Co., Conshohocken, Pa., quotes 3.40c, Sparrows Point equivalent).

Cold-Rolled Sheets: Pittsburgh, Chicago, Cleveland, Gary, Buffalo, Youngstown, Middletown, base, 3.55c; Granite City, 3.65c; Detroit, del., 3.70c; eastern Mich., del., 3.75c; New York, del., 3.96c; Philadelphia, del., 3.93c.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham, 3.85c-3.95c; Youngstown, Sparrows Point, Canton, Middletown, base, 3.95c; Granite City, 4.05c; New York, del., 4.24c; Philadelphia, del., 4.15c; Los Angeles (base, del.), 4.62c; San Francisco (base, del.), 4.625c.

Corrugated Galvanized Sheets, No. 10: (Based on 5 cent zinc) Pittsburgh, Chicago, Gary, Birmingham base, 3.95c-4.05c.

Culvert Sheets, No. 16 flat: (Based on 5 cent zinc; corrugated 10 cents extra) Pittsburgh, Chicago, Gary, Birmingham: Copper alloy, 4.45c-4.55c; copper-iron or pure iron, 4.80c-4.90c. Granite City 4.65c and 5.00c, respectively. Los Angeles (base, del.), 5.24c; San Francisco (base, del.) 5.245c.

Aluminized Sheets: Hot-dipped, coils or cut to lengths: Pittsburgh, 7.50c.

Stainless-Clad 20%: Pittsburgh, Washington, Coatesville, Pa., No. 304, 22.00c; No. 410, 20.00c; No. 430, 20.50c; No. 446, 27.00c. Prices include annealing and pickling.

Long Ternes, No. 10: Pittsburgh, Chicago, Gary, base, 3.85c-4.05c.

Enameling Sheets, No. 12: Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Middletown, 3.90c-3.95c; Granite City, 4.05c; Detroit, del., 4.10c; eastern Mich., 4.15c.

Electrical Sheets, No. 24: Field: Pittsburgh, Chicago, Gary, 4.50c; Kokomo, Ind., 4.60c. Armature: Pittsburgh, Chicago, Gary, 4.80c; Granite City, Ill., Kokomo, Ind., 4.90c. Electrical: Pittsburgh, Chicago, Gary, 5.30c; Granite City, Kokomo, 5.40c. Motor: Pittsburgh, Chicago, Gary, 6.05c; Granite City, 6.15c. Dynamo: Pittsburgh, 6.75c; Granite City, 6.85c. Transformer 72, 7.25c; 65, 7.95c; 58, 8.65c; 52, 9.45c, Pittsburgh.

Strip

Hot-Rolled Strip: Pittsburgh, Chicago, Gary, Birmingham, Youngstown, base, 2.80c; Detroit, del., 2.95c; eastern Mich., del., 3.00c; San Francisco (base, del.), 3.605c; Los Angeles (base, del.), 3.60c.

Cold-Rolled Strip: 0.25 carbon and less: Pittsburgh, Cleveland, Youngstown, 3.55c; Chicago, base, 3.65c; Detroit, del. 3.70c; eastern Mich., 3.75c; Worcester, base, 3.75c-4.10c.

Cold-Finished Spring Steel: Pittsburgh, Cleveland base: 0.26-0.40 carbon, 3.55c; over 0.40 to 0.60 carbon, 5.05c, over 0.60 to 0.80, 5.65c; over 0.80 to 1.00, 7.15c; over 1.00, 9.45c; add 0.20c for Worcester.

Tin, Terne, Plate

Tin Plate: Pittsburgh, Chicago, Gary, Warren, O., 100-lb base box, $5.75; Granite City, Birmingham, Sparrows Point, $5.85.

Electrolytic Tin Plate: Pittsburgh, Gary, Warren, O., 100-lb base box 0.25 lb tin, $4.85; 0.50 lb tin, $5.05; 0.75 lb tin, $5.25; Granite City, Birmingham, Sparrows Point, $4.95, $5.15, $5.35, respectively.

Tin Mill Black Plate: Pittsburgh, Chicago, Gary, Warren, O., base 29-gage and lighter, 3.90c; Granite City, Birmingham, Sparrows Point, 4.00c.

Manufacturing Ternes (Special Coated): Pittsburgh, Chicago, Gary, 100-lb base box $4.90; Granite City, Birmingham, Sparrows Point, $5.00.

Roofing Ternes: Pittsburgh base per package 112 sheets; 20 x 28 in., coating I.C. 8-lb $14.10.

Plates

Carbon Steel Plates: Pittsburgh, Chicago, Gary, Cleveland, Birmingham, Youngstown, Sparrows Point, 2.95c; Coatesville, Claymont, 3.15c; Geneva, Utah, (base, del.), 3.125c; New York, del. 3.24c; Phila., del., 3.15c; St. Louis, del., 2.77c; Boston, del. 3.38c; San Francisco and Los Angeles, del., 3.59c for sizes and grades produced at Geneva, 3.76c for sizes and grades produced at Fontana, Calif.

(Central Iron & Steel Co., Harrisburg, Pa., 4.15c, basing points.)

Floor Plates: Pittsburgh, Chicago, 4.20c.

Open-Hearth Alloy Plates: Pittsburgh, Chicago, 3.80c-4.137c; Coatesville, 4.50c.

Clad Steel Plates: Coatesville, 10% cladding: Nickel clad, 21.50c; inconel-clad, 30.00c; monel-clad, 29.00c.

Pittsburgh, Washington, Coatesville, Pa., 20% stainless-clad, base prices including annealing and pickling: No. 304, 24.00c; No. 410, 22.00c; No. 430, 22.50c; No. 446, 29.00c.

Shapes

Structural Shapes: Pittsburgh, Chicago, Gary, Birmingham, Buffalo, Bethlehem, 2.80c; New York, del., 3.00c; Phila., del., 2.94c; Geneva, Utah (base, del.), 2.975c; Los Angeles (base, del.), 3.41c-3.47c for sizes produced at Torrance, Calif., beyond sizes at Geneva; Los Angeles and San Francisco, del., 3.44c for sizes produced at Geneva; San Francisco, del., 3.41c for sizes produced at Fontana, Calif.

Alloy Structural Shapes: Pittsburgh, Chicago, 3.55c.

Steel Piling: Pittsburgh, Chicago, Buffalo, $3.30 per 100 lb.

Wire and Wire Products

(Fob Pittsburgh, Chicago, Cleveland and Birmingham per 100 pounds).

Wire to Manufacturers in carloads

Bright, basic or bessemer	*$3.55-3.80
Spring (except Birmingham)	*$4.25-**4.50

Wire Products to Trade

Nails	
Standard and cement-coated	†$4.25
Galvanized	‡$4.00
Staples, polished and galvanized	$4.25
Wire, Merchant Quality	
Annealed (6 to 8 base)	§$4.20
Galvanized (6 to 8 base)	§$4.65
(Fob Pittsburgh, Chicago, Birmingham, per base column)	
Woven fence, 15 gage and heavier	††91
Barbed wire, 80-rod spool	††101
Barbless wire, twisted	101
Fence posts (no clamps)	††90
Bale ties, single loop	††91

* Worcester, $3.65, Duluth, $3.60, base. San Francisco (base, del) $4.56 for bright basic only.

** Worcester $4.60, Duluth and Trenton, N. J., $4.75, base. San Francisco (base, del.) $5.63 for MB spring wire; $5.28 black premier.

† Worcester $4.55, Cleveland $4.35, base. San Francisco (base, del.) $5.33.

‡ Duluth $4.00, Cleveland $4.10, base. San Francisco (base, del) $5.08.

§ Worcester $4.30, annealed; $4.75, galvanized. Duluth $4.20, annealed; $4.65, galvanized. San Francisco (base, del.) $5.21, annealed; $5.66, galvanized.

†† San Francisco (base, del.): Woven fence, 114; barbed wire, 121; bale ties, 115. Duluth (base): Woven fence, 91; barbed wire, 103; fence posts 90.

Rails, Supplies

Rails: Standard, over 60-lb fob mill, $2.75 per 100 lb. Light rails (billet), Pittsburgh, Birmingham, $3.10 per 100 lb; light rails (rail steel), Williamsport, Pa., Pittsburgh prices upon application.

Relaying, 60 lb and over fob warehouse $55-$56 per net ton.

Supplies: Track bolts, 7.00c; heat treated, 7.25c. Tie plates, $3.05 per 100 lb, fob mill; $3.40 base, Seattle; $3.20, base, Pittsburg, Calif. Splice bars, $3.25 per 100 lb, fob mill. Standard spikes, 4.00c-4.50c; screw spikes, 5.80c-6.40c. Axles, 4.10c.

Tubular Goods

Standard Steel Pipe: Base price in carlots, threaded and coupled, to consumers about $200 a net ton. Base discounts Pittsburgh on all types; Lorain on steel butt weld, and seamless; Gary, Ind., 2 points less on steel lap weld and 1 point less on steel butt weld on sizes produced in that district.

	Butt Weld				
In.	Blk.	Gal.	In.	Blk.	Gal.
⅛	46	19½	1	56	41½
¼	47	25	1¼	56½	42
⅜	44	22	1½	57	42½
½	50½	34½	2	57½	43
¾	53½	38½	2½ & 3	58	43½

	Lap Weld		Elec. Weld		Seamless	
In.	Blk.	Gal.	Blk.	Gal.	Blk.	Gal.
2	49	34	48½	33½	48	33
2½-3	52	37	51½	36½	51	36
3½-6	54	39	53½	38½	53	38

Line Steel Pipe: Base price in carlots to consumers about $200 a net ton. Base discounts Pittsburgh and Lorain, O.

In.	Butt Weld	In.	Butt Weld
⅛	45	1	55
¼	46	1¼	55½
⅜	43	1½	56
½	49½	2	56½
¾	52½	2½ & 3	57

In.	Lap Weld	Elec. Weld	Seamless
2	48	47½	47
2½ & 3	51	50½	50
3½-6	53	52½	52
8	53½	53	52½
10	53	52½	52
12	52	51½	51

Boiler Tubes: Net base prices per 100 ft, fob Pittsburgh, in carload lots, minimum wall thickness, cut lengths 4 to 24 feet, inclusive.

		——Seamless——		—Elec. Weld—	
O.D. Sizes	B.W.G.	Hot Rolled	Cold Drawn	Hot Rolled	Cold Drawn
1"	13	....	$11.87	$11.51	$11.51
1¼"	13	....	14.06	11.48	13.64
1½"	13	$13.08	15.69	12.69	15.22
1¾"	13	14.88	17.85	14.43	17.31
2"	13	16.67	19.99	16.17	19.39
2¼"	13	18.58	22.29	18.02	21.62
2½"	12	20.47	24.54	19.86	23.80
2½"	12	22.42	26.87	21.75	26.06
2¾"	12	23.76	28.48	23.05	27.63
3"	12	24.93	29.90	24.18	29.00
3¼"	11	29.03	34.81	28.16	33.77
3½"	11	31.17	37.39	30.23	36.27
4"	10	38.69	46.38	37.53	44.90
4½"	9	51.28	61.50	....	....
5"	9	59.39	71.18	....	....
6"	7	91.13	109.27	....	....

Pipe, Cast Iron: Class B, 6-in. and over $74.50 per net ton, Birmingham; $79.50, Burlington, N. J.; $85.06, del. Chicago; 4-in. pipe, $5 higher; class A pipe, $5 a ton over Class B. Prices effective as of July 24, 1947.

Bolts, Nuts

Fob Pittsburgh, Cleveland, Birmingham, Chicago; add 15c per cwt, Lebanon, Pa. Additional discounts: 5 for ca ads; 15 for full containers, except tire, step and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	45 off
⅝ and ⅝ x 6-in. and shorter	46 off
¾-in. and larger x 6-in. and shorter	43 off
All diameters longer than 6-in.	41 off
Tire bolts	35 off
Step bolts	43 off
Plow bolts	54 off
Lag bolts	
All diameters 6 in. and shorter	46 off
All diameters longer than 6 in.	44 off

Stove Bolts

In packages, nuts separate, 65-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3-in., nuts separate.

Nuts

Semifinished hexagon	A.S.E. Light	A.S.E. Reg. and Heavy
⅞-in. and smaller	46 off	....
½-in. and smaller	....	44 off
½-in.-1-in.	44 off	....
⅞-in.-1-in.	....	43 off
1⅛-in.-1½-in.	42 off	41 off
1⅝-in. and larger	....	35 off

Additional discount of 15 for full containers.

Hexagon Cap Screws
(Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright)	53 off
Upset (1035 heat treated)	
⅝ and smaller x 6 and shorter	48 off
¾, ⅞, & 1 x 6 and shorter	44 off

Square Head Set Screws

Upset 1-in. and smaller	57 off
Headless, ¼-in. and larger	40 off
No. 10 and smaller	52 off

Rivets

Fob Pittsburgh, Cleveland, Chicago Birmingham

Structural ½-in. and larger	5.65c
Lebanon, Pa.	5.80c
⅞-in. and under	55 off
Lebanon, Pa.	55 off plus 15c per cwt

Washers, Wrought

Fob Pittsburgh, Chicago, Philadelphia, to jobbers and large nut and bolt manufacturers, lcl $1-$2 off

Tool Steels

Tool Steel: Pittsburgh, Bethlehem, Syracuse, Canton, O., Dunkirk, N. Y., base, cents per lb; reg. carbon 16.00-17.00c; extra carbon 20.00c; special carbon 24.00c; oil-hardening 26.00c; high carbon-chromium 47.00c.

W	Cr	V	Mo	Base, Per lb
18.00	4	1	...	82.00c
1.5	4	1	8.5	59.00c
12	3	0.50	...	67.00c
6.40	4.15	1.90	5	63.00c
5.50	4.50	4	4.50	80.00c

Stainless Steels

Base, Cents per lb

Grade	Bars, Drawn Wire, Structurals	Plate	Sheets	Hot Rolled Strip	Cold Rolled Strip
CHROMIUM NICKEL STEELS					
301	26.00c	29.50c	37.00c	22.00c	28.00c
302	26.00	29.50	37.00	23.50	30.50
303	28.50	31.50	39.00	29.50	36.00
304	27.50	31.50	39.00	25.50	32.50
308	31.50	37.00	44.50	31.00	38.00
309	39.00	43.50	51.00	40.50	51.00
310	53.50	56.50	57.50	52.00	61.00
316	43.50	48.00	52.00	43.50	52.00
321	31.50	37.00	44.50	32.00	41.50
347	36.00	41.50	49.00	36.00	45.50
431	21.00	24.00	31.50	19.00	24.50
440A	26.00	31.00	36.50	26.00	30.50
STRAIGHT CHROMIUM STEEL					
403	23.50	27.00	32.00	23.00	29.50
410	20.50	23.50	29.00	18.50	24.00
416	21.00	24.00	29.50	20.00	25.50
420	26.00	31.00	36.50	26.00	39.50
430	21.00	24.00	31.50	19.00	24.50
430F	21.50	24.50	32.00	20.50	27.00
442	24.50	28.00	35.50	26.00	35.00
443	24.50	28.00	35.50	26.00	35.00
446	30.00	33.00	39.50	38.00	56.50
*501	9.00	13.00	17.50	13.00	18.50
*502	10.00	14.50	18.50	14.50	19.50
†STAINLESS CLAD STEEL (30%)					
304	....	24.00	22.00	....	....
410	....	22.00	20.00	....	....
430	....	22.50	20.50	....	....
446	....	29.00	27.00	....	....

* Low chromium. † Fob Pittsburgh and Washington, Pa.; plate prices include annealing and pickling.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton	No. 2 Foundry	Basic	Bessemer	Malleable
Bethlehem, Pa., base	$37.50	$37.00	$38.50	$38.00
Newark, N. J., del.	39.34	38.84	40.34	39.84
Brooklyn, N. Y., del.	40.50	....	....	41.00
Philadelphia, del.	39.22	38.72	40.22	39.72
Birdsboro, Pa., base	40.50	40.00	41.50	41.00
Birmingham, base	33.38*	32.88*	....	....
Baltimore, del.	39.78	....	....	....
Chicago, del.	37.12	....	....	....
Cincinnati, del.	38.25	....	37.75	....
Newark, N. J., del.	39.46	....	....	....
Philadelphia, del.	38.84	....	....	....
St. Louis, del.	37.37	....	36.87	....
Buffalo, base	*36.00	*36.00	37.00	*36.50
Boston, del.	42.48	42.48	43.48	42.98
Rochester, del.	37.84	37.84	38.84	38.34
Syracuse, del.	38.50	38.50	39.50	39.00
Canton, Massillon, O., base	36.00	35.50	....	36.50
Chicago, base	36.00	35.50	37.00	36.50
Milwaukee, del.	37.32	36.82	38.32	37.83
Muskegon, Mich., del.	39.83	....	....	40.33
Cleveland, fob furnace	*36.00	*35.50	37.00	*36.50
Akron, del.	37.67	37.17	38.67	38.17
Duluth, base	36.50	36.00	37.50	37.00
Erie, Pa., base	36.00	35.50	37.00	36.50
Everett, Mass., base	45.00	....	....	45.50
Granite City, Ill., base	37.00	36.50	....	37.00
St. Louis, del.	37.75	37.25	....	37.75
†**Neville Island, Pa., base**	36.50	36.00	37.00	36.50
Pittsburgh, del., N.&S. Sides	37.33	36.83	37.83	37.33
Provo, Utah, base	36.50	36.00	....	....
Seattle, Tacoma, Wash., del.	42.44	....	....	....
Portland, Oreg., del.	42.44	....	....	....
Sharpsville, Pa., base	36.50	36.00	37.00	36.50
Steelton, Pa., base	37.50	37.00	38.50	38.00
Struthers, O., base	37.00	36.50	37.50	37.00
Swedeland, Pa., base	41.50	41.00	42.50	42.00
Troy, N. Y., base	38.00	37.50	39.00	38.50
Toledo, O., base	36.00	35.50	37.00	36.50
Cincinnati, del.	39.50	39.00	....	....
Youngstown, O., base	36.50	36.00	37.00	36.50
Mansfield, O., del.	39.48	38.98	39.98	39.48

† To Neville Island base add: 66c for McKees Rocks, Pa., $1.01 Lawrenceville, Homestead, McKeesport, Ambridge, Monaco, Aliquippa; 97c (water), Monongahela; $1.33 Oakmont, Verona; $1.49 Brackenridge.

* Republic Steel Corp., quotes $3 a ton higher at Birmingham, effective Aug. 13; $2.00 higher at Buffalo for No. 2 foundry and malleable and $1.50 higher for basic and $2.75 higher at Cleveland, effective on shipments during week ended Oct. 12.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent (base)	$45.50		
6.51-7.00	$46.75	9.01- 9.50	53.00
7.01-7.50	48.00	9.51-10.00	54.25
7.51-8.00	49.25	10.01-10.50	55.50
8.01-8.50	50.50	10.51-11.00	56.75
8.51-9.00	51.75	11.01-11.50	58.00

Fob Jackson, O., per gross ton; Buffalo base $1.25 higher. Buyer may use whichever base is more favorable.

Bessemer Ferrosilicon

Prices same as for high silicon silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron: Si 14.07-14.50%, $72.50, Jackson, O.; $73.75, Niagara Falls; $78, pigiets, $76, open-hearth and foundry grade, Keokuk, Iowa. Add $1 a ton for each additional 0.5% Si to 18%; 50c for each 0.5% Mn over 1%; $1 a ton for 0.045% max. phos.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. Fob furnace, Lyles, Tenn....$44.00 (For higher silicon irons a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Gray Forge

Neville Island, Pa. $36.00

Low Phosphorus

Steelton, Pa., Buffalo, Troy, N. Y., $42.00; Birdsboro, Pa., $45 base; Philadelphia, $44.22, del. Intermediate phosphorus, Central furnace, Cleveland, $39.00.

Differentials

Basng point prices are subject to following differentials:

Silicon: An additional charge of 50 cents a ton for each 0.25 per cent silicon in excess of base grade (1.75% to 2.25%).

Phosphorus: A reduction of 38 cents a ton for phosphorus content of 0.70 per cent and over.

Manganese: An additional charge of 50 cents a ton for each 0.50 per cent, or portion thereof, manganese in excess of 1%.

Nickel: An additional charge for nickel content as follows: Under 0.50%, no extra; 0.50% to 0.74%, inclusive, $2 a ton; for each additional 0.25% nickel, $1 a ton.

Metallurgical Coke

Price per Net Ton

Beehive Ovens

Connellsville, furnace	$11.50-$12.50
Connellsville, foundry	14.00- 15.00
New River, foundry	12.50
Wise county, foundry	11.15
Wise county, furnace	10.65

Oven Foundry Coke

Kearney, N. J., ovens	$17.85
Chicago, outside del.	17.50
Chicago, del.	18.50
Terre Haute, del.	18.05
Milwaukee, ovens	18.25
New England, del.	19.50
Birmingham, del.	15.00
Indianapolis, ovens	17.00
Cincinnati, del.	16.50
Ironton, O., ovens	15.50
Painesville, ovens	16.60
Cleveland, del	17.90
Buffalo, del.	18.25
Detroit, del.	17.65
Philadelphia, ovens	16.75
Swedeland, Pa., ovens	16.75
Portsmouth, O., ovens	16.00
Fairmont, W. Va., ovens	15.75
Pittsburgh, del.	17.61

Coal Chemicals

Spot, gal. freight allowed east of Omaha. Effective as of Apr. 1, 1947.

Pure and 90% benzol	19.00c
Toluol, two degrees	23.00c
Industrial xylol	23.00c
Solvent naphtha	26.00c

Per pound fob works

Phenol (car lots, returnable drums)	11.25c
Do., less than carlots	12.00c
Do., tank cars	10.25c

Eastern plants, per pound

Naphthalene flakes, balls, bbl, to jobbers, "house-hold use"	9.50c

Per ton, bulk, fob plants

Sulphate of ammonia	$30.00

Refractories

Per 1000, fob shipping point

Net Prices

Fire Clay Brick

Super Duty

Pa., Mo., Ky.	$87.00

High Heat Duty

Pa., Ill., Md., Mo., Ky.	70.00
Ala., Ga.	70.00
N. J.	75.00

Intermediate Heat Duty

Ohio	64.00
Pa., Ill., Md., Mo., Ky.	64.00
Ala., Ga.	56.00
N. J.	67.00

Low-Heat Duty

Pa., Md., Ohio	56.00

Ladle Brick

(Pa., O., Va., Mo.)

Dry Press	47.00
Wire Cut	45.00

Malleable Bung Brick

All bases	80.00

Silica Brick

Pennsylvania	70.00
Joliet, E. Chicago	79.00
Birmingham, Ala.	70.00

Basic Brick

Net tons, fob Baltimore, Plymouth Meeting, Chester, Pa.

Chrome brick	59.00
Chem. bonded chrome	59.00
Magnesite brick	81.00
Chem. bonded magnesite	70.00

Magnesite

Domestic dead-burned grains, net ton, fob Chewelah, Wash.

Bulk	24.00
Single bags	28.00

Dolomite

Domestic, dead-burned, bulk, net ton, fob Billmeyer, Blue Bell or Williams, Pa., Millville, W. Va., Nario, Millersville, Martin, Gibsonburg or Woodville, O., $11.05; Midwest (fob Thornton or McCook, Ill.), add $0.10; Missouri Valley (fob Dolly Siding, and Bonne Terre, Mo.), add $0.20.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (Natural) Lower Lake Ports

Old range bessemer	$5.95
Old range nonbessemer	5.80
Mesabi bessemer	5.70
Mesabi nonbessemer	5.50
High phosphorus	5.55

Eastern Local Ore

Cents, units, del. E. Pa.

Foundry and basic 56.63% contract	15.25

Foreign Ore

Cents per unit, cif Atlantic ports

No. African low phos.	Nom.
Swedish basic, 60 to 68%	13.50
Spanish, No. African basic, 50 to 60%	Nom.
Brazil iron ore, 68-69% fob Rio de Janeiro, nom.	5.50-6.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid	$32-$34

Manganese Ore

46.50%, duty paid, fob cars, New York, Philadelphia, Baltimore, Norfolk, Va., Mobile, Ala., New Orleans, 63.00c-67.00c.

Chrome Ore

Gross ton fob cars, New York, Philadelphia, Baltimore, Charleston, S. C., Portland, Oreg., or Tacoma, Wash.

(S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African	
48% 2.8:1	$37.50
48% 3:1	39.00
48% no ratio	31.00
South African (Transvaal)	
44% no ratio	$27-$27.50
45% no ratio	28.00
48% no ratio	30.00
50% no ratio	31.00
Brazilian—nominal	
44% to 2.5:1 lump	$33.65
48% 3:1 lump	43.50
Rhodesian	
45% no ratio	$27-$27.50
48% no ratio	30.00
48% 3:1 lump	39.00
Domestic (seller's nearest rail)	
48% 3:1	$39.00

Molybdenum

Sulphide conc., Io., Mo. cont., Mines	$0.75

Fluorspar

Metallurgical grade, fob shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $33; 65% to 70%, $32; 60% to 65%, $31; less than 60%, $30.

HIGH-STRENGTH—LOW-ALLOY STEELS

Prices in dollars per 100 pounds

	Pittsburgh	Chicago	Gary	Youngstown	Sparrows Point	Buffalo	Bethlehem	Canton	Massillon
Sheets, Hot-Rolled	4.30	*4.30	4.30	4.30	4.30	4.30	...	...	...
Cold-Rolled	5.30	5.30	5.30	5.30	...	5.30	...	...	...
Galvanized	5.85	...	...	...	...	...	...	...	...
Strip, Hot-Rolled	4.30	4.30	4.30	4.30	...	...	...	...	...
Cold-Rolled	5.30	5.30*	5.30*	5.30	...	...	...	...	...
Shapes, Structural	4.30	4.30	...	4.30	...	...	4.30	...	...
Plates	4.55	4.55	4.55	...	4.55	...	...	...	...
Bars, Small Shapes	4.45	4.45	4.45	4.45	...	4.45	...	4.45	4.45

* Nax High Tensile, produced by Great Lakes Steel Corp., quoted 10 cents higher

WAREHOUSE STEEL PRICES

Prices, cents per pound, for delivery within switching limits, subject to extras.

	SHEETS					STRIP		BARS				PLATES	
	H-R 10G	C-R 10G	C-R 17G	Gal. *10G	Gal. *24G	†H-R	†C-R	H-R Rds. ⅝" to 3"	C-F Rds. ½"& up	H-R Alloy (8-4140)	Structural Shapes	Carbon ⅝"-¾"	Floor ⅜" & Thicker
Boston (city)	4.90	5.97[4]	5.67[4]	6.10[4]	7.35[4]	4.97	6.71	4.92	5.57	7.17	4.77	5.05	6.72
††New York (city)	4.87	6.07	5.77[3]	6.07	7.32	4.97	....	4.97	5.52	6.97[3]	4.72	5.02	6.70
New York (country)	4.72	5.92	5.62[3]	5.92	7.17	4.82	....	4.82	....	....	4.57	4.87	6.55
Philadelphia (city)	4.64	6.23[9]	5.83[9]	5.84	7.09	4.73	5.63	4.78	5.48	6.92[9]	4.52	4.79	6.13
Philadelphia (country)	4.54	6.13[9]	5.73[9]	....	....	4.63	5.53	4.68	....	6.82[9]	4.42	4.69	6.03
Baltimore (city)	4.29†	5.85	5.55	5.54	6.79	4.70	....	4.75	5.45	....	4.64	4.74	6.20
Baltimore (country)	4.19†	5.75	5.45	5.35	6.60	4.60	....	4.65	....	....	4.54	4.64	6.10
Washington (city)	4.75	....	....	....	....	4.95	....	5.00	5.60[13]	....	4.90	4.95	6.60
Washington (country)	4.65	....	....	....	....	4.85	....	4.90	....	....	4.80	4.85	6.50
Norfolk, Va.	4.75	....	....	....	....	....	....	5.05	5.85	....	5.00	5.00	6.75
Memphis, Tenn. (city)	4.77[20]§§	5.79[20]†	....	....	....	4.97[20]	....	4.92[20]	5.79	....	4.92[20]	5.12[20]	6.79[20]
Memphis, Tenn. (country)	4.67[20]§§	5.69[20]†	....	....	....	4.87[20]	....	4.82[20]	5.69	....	4.82[20]	5.02[20]	6.69[20]
Buffalo (city)	4.45	....	5.20[8]	5.95	....	4.65	5.60	4.40	5.10	8.15	4.40	4.85	6.20
Buffalo (country)	4.30	....	5.05[8]	5.50	....	4.20	5.45	4.25	4.95	8.15	4.25	4.40	5.75
Pittsburgh (city)	4.25§§	....	5.10[8]†	5.65	6.90	4.35	5.35	4.40	5.10	10.65	4.40	4.60	5.90
Pittsburgh (country)	4.15§§	....	4.90[8]†	5.50	6.75	4.20	5.20	4.25	4.95	10.50	4.25	4.45	5.75
Cleveland (city)	4.45	5.50[8]	5.20[8]	5.638	6.888	4.488	5.35	4.40	5.10	6.908	4.611	4.55	6.111
Cleveland (country)	4.30	5.35[8]	5.05[8]	....	....	....	5.20	4.25	4.95	....	....	4.40	....
Cincinnati (city)	4.671	5.516[8]	....	5.716	6.466	4.694	....	4.703	5.353	....	4.744	4.903	6.344
Chicago (city)	4.45	5.50[8]	5.20[8]	5.65	6.90	4.35	5.35	4.40	5.10	6.65[13]	4.40	4.60	6.05
Chicago (country)	4.30	5.35[8]	5.05[8]	5.50	6.75	4.20	5.20	4.25	4.95	8.15	4.25	4.40	5.75
Milwaukee	4.599	5.649[8]	5.349[8]	5.799	7.049	4.499	5.599	4.549	5.249	6.949[9]	4.549	4.749	6.199
St. Louis	4.749	5.799[9]	5.499[8]	5.974	7.224	4.649	5.774	4.699	5.424[13]	7.124	4.699	4.899	6.349
Birmingham (city)	4.45[20]§§	....	....	5.80	....	4.45[20]	....	4.40[20]	5.93[22]	....	4.40	4.65	6.58
Birmingham (country)	4.30[20]§§	....	....	5.50	....	4.30[20]	....	4.25[20]	....	....	4.25	4.50	....
New Orleans	4.98[20]**	....	6.29[18]	....	....	5.18[20]	....	5.13[20]**	6.29[11]	....	5.03[20]**	5.33[20]	7.28[20]
Omaha, Nebr.	5.068	....	....	6.468	7.718	5.168	....	5.218	5.918	....	5.218	5.418	6.868
Seattle, Tacoma, Wash.	5.30[17]	....	7.10[5]	6.70	....	5.60[17]	....	5.30[17]	7.45[10]	8.50[13]	5.25[17]	5.45	7.55[20]

Base Quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over, cold finished bars, 1000 lb and over; galvanized sheets, 450 to 1499 lb; [1]—any quantity; [2]—300 to 1999 lb; [3]—150 to 2249 lb; [4]—three to 24 bundles; [5]—450 to 1499 lb; [6]—one bundle to 1499 lb; [7]—one to nine bundles; [8]—400 to 1499 lb; [9]—1000 to 1999 lb; [10]—450 to 39,999 lb; [11]—1000 to 39,999 lb; [12]—1000 lb and over; [13]—400 to 14,999 lb; [14]—400 to 39,999; [15]—2000 lb and over; [16]—1000 to 4999 lb; [17]—300 to 9999 lb; [18]—1500 to 1999 lb; [19]—1500 to 39,999 lb; [20]—400 to 3999 lb; [21]—400 lb and over; [22]—500 to 1499 lb.

* Include gage and coating extra, except Birmingham (coating extra excluded); † does not include gage extras; ‡ 15 gage; § as rolled, except Indianapolis, Los Angeles, San Francisco, and Pittsburgh where price represents annealed bars; ** add 0.46 for sizes not rolled in Birmingham; †† same prices quoted for Jersey City, N. J.; ‡‡ add 15c for 100 lb for slow moving items; §§ 18 gage and heavier.

PRICES OF LEADING FERROALLOYS PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si.) Carlot per gross ton, $47, Palmerton, Pa., $51, Pittsburgh. 16% to 19% Mn., $46, Palmerton, $50, Pittsburgh.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.). Carload, lump, bulk $145 per gross ton of alloy, carload packed $153, ton lot $165, less ton $172; fob New Orleans, Mobile, Philadelphia, Baltimore, or New York. Carload, lump, bulk $151, fob cars Pittsburgh, including 50c switching charge. Add, or subtract, $1.85 for each 1%, or fraction thereof, of contained manganese over 82% or under 78%. **West Coast Prices:** Carload (80,000 lb or more), lump, bulk, same price and basing points as above. All other prices for shipment from Pacific Coast warehouses, add $23.83 to above prices. Delivery is fob Portland, Los Angeles, South San Francisco, or Seattle warehouses, with railroad freight allowed on shipments of 25 gross tons or more.

Ferromanganese-Silicon Mix: (Mn 20-25%, Si 47-54%, Fe 25-30%, C 6% max.). Eastern Zone, contract, carload, packed, 20 M x D, 14.25c per lb of alloy, ton lot 15c, less ton 16c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.6c for l.c.l. Freight allowed.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Eastern Zone, carload, lump, bulk 16.5c per lb of contained Mn, carload packed 17c, ton lot 17.6c, less ton 18.2c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.7c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Eastern Zone, carload, 2" x D, bulk 32c per lb of metal, carload packed 32.5c, ton lot 34c, less ton 36c; Central, add 1c for c.l. and 1.45c for l.c.l.; Western, add 1.45c for c.l. and 2.4c for l.c.l. Freight allowed. Spot, add 2c.

Silicomanganese: (Mn 65-70%). Eastern Zone, contract, lump, bulk, 1.50% C grade, 17-20% Si, 7.4c per lb of alloy, carload packed, 7.95c, ton lot 8.45c, less ton 8.95c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. For 2.0% C grade, Si 15-17%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Eastern Zone, contract, c.l., lump, bulk 17.6c per lb of contained Cr, c.l., packed 18.2c, ton lot 18.8c, less ton 19.5c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Special Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Eastern Zone, contract, carload, 8MxD, bulk 19.1c per lb of contained Cr, carload, packed 19.7c, ton lot 20.4c, less ton 21.35c; Central, add 0.4c for c.l. and 1.3c for l.c.l.; Western, add 0.55c for c.l. and 2.1c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Eastern Zone, contract, carload, lump, bulk, max. 0.03% C 27c per lb of contained Cr, 0.04% C 26c, 0.05% C 25.5c, 0.06% C 25c, 0.10% C 24.5c, 0.15% C 24.0c, 0.20% C 23.75c, 0.15% C 23.5c, 1% C 23.0c, 2% C 22.5c. Carload packed add 0.8c, ton lot add 1.35c, less ton add 2.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, and C 1.25% max.). Eastern Zone, contract, carload, lump, bulk 23c per lb of contained chromium, carload, packed 23.8c, ton lot 24.35c, less ton 25.35c; Central, add 0.4c for c.l. and 0.65c for l.c.l.; Western, add 0.5c for c.l. and 1.85c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 2c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 2c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe.). Eastern Zone, contract, carload, 1" x D, bulk, max. 0.50% C grade, 0.87c per lb of contained chromium, carload packed 0.88c, ton lot 89.5c, less ton 91.5c; Central, add 1.5c for c.l. and 2.5c for l.c.l.; Western, add 2.75c for c.l. and 4.5c for l.c.l. Freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 8.8c per lb of contained Si, carload packed 10c, ton lot 10.65c, less ton 11.3c; Central, add 0.5c for c.l. and 1.25c for l.c.l.; Western, add 0.7c for c.l. and 1.8c for l.c.l. Freight allowed. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.). Add 1.3c to 50% Ferrosilicon prices.

Low-Aluminum 65% Ferrosilicon: (Al 0.50% max.). Eastern Zone, contract, lump bulk 11.55c per lb of contained Si, carload packed 12.6c, ton lot 13.2c, less ton 13.8c; Central, add 0.45c for c.l. and 0.9c for l.c.l.; Western, add 1.4c for c.l. and 5.75c for l.c.l. Freight allowed. Spot, add 0.35c.

85% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk 12.7c per lb of contained Si, carload packed 13.7c, ton lot 14.25c, less ton 14.8c; Central, add 0.3c for c.l. and 0.7c for l.c.l.; Western, add 1.05c for c.l. and 4.4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% Ferrosilicon prices.

90-95% Ferrosilicon: Eastern Zone, contract, carload, lump, bulk, 14.35c per lb of contained Si, carload packed 15.35c, ton lot 15.85c, less ton 16.35c; Central, add 0.3c for c.l. and 0.65c for l.c.l.; Western, add 1c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

Low - Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.65c to above 90-95% Ferrosilicon prices.

15% Ferrosilicon, Ground Form: (15.01-15.5% Si) Contract or spot, c.l., packed, 65 M x D or 100 M x D, $114 per gross ton of alloy, fob Niagara Falls, N. Y.; 48 and 65 M x D, $111, and 100 M x D, $115, fob Keokuk, Iowa. (15.51-16% Si) Add $1 per gross ton.

Silicon Metal: (Over 97% Si and 1% max. Fe). Eastern Zone, c.l., lump, bulk, regular, 16.5c per lb of Si, c.l. packed 17.5c, ton lot 18c, less ton 18.5c; Central, add 0.6c for c.l. and 2.25c for l.c.l.; Western, add 1.2c for c.l. and 4c for l.c.l Add 1c for max. 0.20% calcium grade. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade, analyzing over 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract basis fob Niagara Falls, N. Y., lump per lb c.l. 6.50c; ton lots packed, 7c; 200 to 1999 lb, 7.75c; smaller lots, 8.25c. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Eastern Zone, contract, carload, bulk, 11.1c per lb of briquet, carload packed 11.6c, ton lot 12c, less ton 12.4c; Central, add 0.25c for c.l. and 0.9c for l.c.l.; Western, add 0.35c for c.l. and 1.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Eastern Zone, contract, carload, bulk, 8c per lb of briquet, c.l. packed, 8.6c, ton lot 9c, less ton 9.4c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l. Freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Eastern Zone, contract, c.l., bulk 9.65c per lb of briquet, c.l. packed 10.25c, ton lot 10.65c, less ton 11.05c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.8c for c.l. and 2.5c for l.c.l., freight allowed. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si). Eastern Zone, contract, carload, bulk 4.65c per lb of briquet, c.l. packed 5.25c, ton lot 5.65c, less ton 6.05c. **(Small size**—weighing approx. 2½ lb and containing exactly 1 lb of Si). Eastern Zone, carload, bulk 4.8c, c.l. packed 5.4c, ton lot 5.8c, less ton 6.2c; Central, add 0.25c for c.l. and 0.6c for l.c.l.; Western, add 0.45c for c.l. and 0.9c for l.c.l. Freight allowed. Add 0.25c for notching, small size only. Spot, add 0.25c.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18%, and Si 53-59%). Eastern Zone, contract, carload, lump, bulk 16.75c per lb of alloy, carload packed 17.35c, ton lot 18.85c, less ton 19.85c; Central, add 0.5c for c.l. and 0.85c for l.c.l.; Western, add 2.55c for c.l. and 2.6c for l.c.l. Freight allowed. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Eastern Zone, contract, carload, lump, bulk 15.5c per lb of alloy, carload packed 16.5c, ton lot 18c, less ton 19c; Central, add 0.5c for c.l. and 0.75c for l.c.l.; Western, add 2.55c for c.l. and 2.90c for l.c.l. Freight allowed. Spot, add 0.25c.

VANADIUM ALLOYS

Ferrovanadium: Open Hearth Grade (Va 50-55%, Si 8% max., C 3% max.). Eastern Zone, contract, any quantity, $2.90 per lb of contained Va; Central, add 2c for c.l. and 3c for l.c.l.; Western, add 6c for c.l. and 9c for l.c.l. Freight allowed. Spot, add 10c. **Special Grade** (Va 50-55%, Si 4% max., C 1% max.), $3. **High Speed Grade** (Va 50-55%, Si 1.50% max., C .20% max.), $3.10.

Vanadium Oxide: All Zones, contract, less carload lots, $1.20 per lb of contained V_2O_5. Spot, add 5c.

Grainal: Vanadium Grainal No. 1, 87.5c; No. 6, 60c; No. 79, 45c; all fob Bridgeville, Pa., usual freight allowance.

TITANIUM ALLOYS

Ferrotitanium: (Ti 20-25%, Al 3% max., Si 4% max., C 0.10% max.). Eastern Zone, contract, ton lot, 2" x D, $1.35 per lb of contained Ti, less ton $1.40. (Ti 40-45%, Al 7% max., Si 4% max., C 0.10% max.). Ton lot $1.23, less ton $1.25; Central, add 4c for 20-25% Ti grade, and 2.1c for 40-45% grade; Western, add 13.5c for 20-25% Ti grade, and 7.2c for 40-45% grade. Freight allowed. Spot, add 5c.

Ferrotitanium, High-Carbon: (15-20%). Contract basis, per net ton, fob Niagara Falls, N. Y., freight allowed to destination east of Mississippi river and north of Baltimore and St. Louis, 6.8% C, $142.50; 3-5% C, $157.50.

TUNGSTEN ALLOYS

Ferrotungsten: (W 70-80%). Eastern Zone, contract, 10,000 lb W or more, $2.50 per lb of contained W; 2000 lb W to 10,000 lb W, $2.60; less than 2000 lb W, $2.72. Spot, add 2c.

Tungsten Powder: (W 98.8% min.). Eastern Zone, contract or spot, 1000 lb or more, $3.05 per lb of contained W; less than 1000 lb W, $3.15.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, Fe 40-45%, C 0.20% max.). Eastern Zone, contract, c.l., lump, bulk 6c per lb of alloy, c.l. packed 6.55c, ton lot 6.9c, less ton 7.25c; Central, add 0.25c for c.l. and 1.1c for l.c.l.; Western, add 0.6c for c.l. and 3.95c for l.c.l. Freight allowed. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Eastern Zone, contract, carload, lump, packed 18.4c per lb of alloy, ton lot 19.15c, less ton 20.4c; Central, add 0.6c for c.l. and 1.05c for l.c.l.; Western, add 3.05c for c.l. and 4c for l.c.l. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Eastern Zone, contract, ton lots, 1" x D, $1.20 per lb of alloy, freight allowed. Less ton lots $1.30; Central, add 0.75c; Western, add 2.9c; Spot add 5c.

Borosil: (3 to 4% B, 40 to 45% Si). $6.25 per lb contained B, fob Philo, O., freight not exceeding St. Louis rate allowed.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 0.90 to 1.15%). Net ton to carload, 8c per lb, fob Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Mn 5% max., Si 8% max., C 0.5% max.). Eastern Zone, contract, ton lot, 2" x D, $2.50 per lb of contained Cb, less ton $2.55; Central, add 1.65c; Western, add 6.45c. Freight allowed. Spot, add 10c.

CMSZ Mixes: No. 4—Cr 45-49%, Mn 4-6%, Si 18-21%, Zr 1.25-1.75%, C 3-4.5%; No. 5—Cr 50-56%, Mn 4-6%, Si 13.50-16.0%, Zr 0.75-1.25%, C 3.50-5%). Eastern Zone, carload, 12 M x D, bulk 15.75c per lb of material, carload packed 16.5c, ton lot 17.25c, less ton 18c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr 3-5%, Ti 9-11%, Boron 0.55-0.75%). Eastern Zone, carload, packed, 1" x D, 37c per lb of alloy, ton lot 39c, less ton 41c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Eastern Zone, contract, carload, packed, ½" x 12 M, 14.3c per lb of alloy, ton lot 15.05c, less ton 15.8c; Central, add 0.3c for c.l. and 1.1c for l.c.l.; Western, add 0.3c for c.l. and 3.05c for l.c.l. Freight allowed. Spot, add 0.25c.

Simanal: (Approx. 20% each Si, Mn, Al). Packed, lump, carload 9c, ton lots 9.25c, smaller lots 9.75c per lb alloy; freight not exceeding St. Louis rate allowed.

Ferrophosphorus: (17-19% based on 18% P content with unitage of $3 for each 1% of P above or below the base) Gross tons per carload fob sellers' works, with freight equalized with Rockdale, Tenn.; contract price $58.50, spot $62.25.

Ferromolybdenum: (55-75%). Per lb, contained Mo, fob Langeloth and Washington, Pa., furnace, any quantity 95.00c.

Nonferrous Metal Supplies Improving

Many producers and fabricators adopt firm pricing policy . . . Reynolds has new system of pricing extruded shapes

New York—Statistics issued recently indicate supplies of lead and zinc are steadily increasing. Copper and tin stocks also have improved in recent weeks. Adoption of a firm pricing policy by leading producers and fabricators of lead and zinc also indicates that the critical point in nonferrous metal supplies has passed.

COPPER—Leading brass mills have announced a firm price policy covering fully specified orders that can be scheduled for shipment within a period of 60 days from acceptance of orders. Orders for shipment beyond 60 days will only be accepted upon the basis of prices to be fixed 60 days prior to date of scheduled shipment. This policy has been adopted by several other segments of the nonferrous metal industry.

While the domestic market held steady at 21.50c, Connecticut Valley, the export market was stronger with sales reported up to 21.50c, fas New York.

ZINC—Smelter production of zinc increased to 67,843 tons, or a daily rate of 2261 tons in September, compared with 66,852 tons, or a daily rate of 2157 tons, in August. Total smelter production in the first nine months of this year amounted to 635,580 tons compared with 558,159 tons in the like 1946 period. Shipments to domestic consumers declined slightly to 50,532 tons from 52,132 in August, making the total for the first nine months 520,289 tons compared with 488,940 tons in the like 1946 period. Shipments on export account rose to 10,285 tons in September from only 5487 in August while 2638 tons of zinc were transferred from the Office of Metals Reserve stockpile to the permanent stockpile held by the Army and Navy Munitions Board. Total shipments and withdrawals, therefore, aggregated 63,500 tons, or about 2850 tons more than in August.

Stocks of zinc at the end of September showed a further increase of about 4350 tons to a total of 195,260 tons, the largest tonnage on hand since November of last year when stocks totaled 195,828 tons.

Unfilled orders on producers' books amounted to 38,041 tons at the end of September or a decline of about 2000 tons from the previous month. The order backlog has been declining steadily since the beginning of this year when it totaled 58,057 tons.

LEAD—Total receipts of lead in ore and scrap by smelters increased during August to 42,955 tons from 41,207 tons in July, according to the American Bureau of Metal Statistics. This brought the total for the first eight months to 354,770 tons compared with only 283,525 tons in the like 1946 period.

TIN—Of the 10,450 tons of Straits tin which the Reconstruction Finance Corp. has purchased thus far this year, 8450 tons had been shipped up to the end of September and the remaining 2000 tons are scheduled for shipment this month. Malayan tin shipments during September totaled 3100 tons, of which 1820 tons were from Singapore and 1280 tons from Penang. Of the September total, the United States received 1850 tons.

According to the International Tin Research & Development Council, The Hague, world's production of tin in the first seven months totaled 59,300 tons while apparent consumption amounted to 75,000 tons. World's stocks of tin and tin in ore, exclusive of consumers' stocks, as of July 1, 1947, are estimated at 90,000 tons, or a drop of 23,000 tons since Jan. 1.

ALUMINUM—Reynolds Metals Co. announced an entirely new system of pricing aluminum extruded shapes last week. This system is complete departure from the "factor" pricing method and is heralded as promoting price reductions on heavier aluminum extruded shapes weighing 0.25 pound per square foot and up. These price changes may amount to as much as 4 or 5 cents a pound, or a percentage decrease of about 8 to 10 per cent. It was also announced that die charges for solid-shape extrusion dies and for rod and bar extrusion dies will be absorbed by Reynolds after certain minimum shipments of metal are made from such dies.

SILVER—No new developments were noted in the silver market last week, prices holding unchanged at 71.37½c an ounce.

NONFERROUS METAL PRICES

Copper: Electrolytic, carlots 21.50c, delivered Conn.; Lake, 21.62½c, del. Conn. Dealers may add ¾c for 5000 lb to carload; 1c, 1000-4999 lb; 1½c, 500-999 lb; 2c, 0-499 lb. Casting, nom., refinery, 20,000 lb or more; nom., less than 20,000 lb.

Brass Ingot: 85-5-5-5 (No. 115) 17.50c-18.00c; 88-10-2 (No. 215) 25.75-26.25c; 80-10-10 (No. 305) 21.50-22.00c; No. 1 yellow (No. 405) 13.75-14.50c; carlot prices, including 25c per 100 lb freight allowance; add ¼c for less than carloads.

Zinc: Prime western 10.50c, brass special 10.75c, intermediate 11.00c, E. St. Louis; high grade 11.50c, del., carlots. For 20,000 lb to carlots add 0.15c; 10,000-20,000 lb 0.25c; 2000-10,000 lb 0.4c; under 2000 lb 0.50c.

Lead: Common 14.80c-14.85c, chemical 14.90c, corroding 14.90c, E. St. Louis for carlots.

Primary Aluminum: 99% plus, ingots 15.00c del., pigs 14.00c del.; metallurgical 94% min. 13.50c del. Base 10,000 lb and over; add ½c 2000-9999 lb; 1c less through 2000 lb.

Secondary Aluminum: Piston alloy (No. 122 type) 14.00-14.50c; No. 12 foundry alloy (No. 2 grade) 13.75c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1 (95-97½%) 14.50c; grade 2 (92-95%) 12.75c; grade 3 (90-92%) 12.00-12.25c; grade 4 (85-90%) 11.50-11.75c. Above prices for 30,000 lb or more; add ¼c 10,000-30,000 lb; ½c 5000-10,000 lb; ¾c 1000-5000 lb; 1¼c less than 1000 lb. Prices include freight at carload rate up to 75c per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots (4-notch, about 20 lb), 10,000 lb and over, 20.50c; 2000 to 9999 lb, 21.50c; 100 to 1999 lb, 22.50c. Extruded rounds, 12 inches long, 1.312 inches in diameter, less than 25 lb, 52.00c-56.00c; 25 to 99 lb, 42.00c-46.00c; 100 to 4000 lb, 35.00c-36.00c.

Tin: Prices ex-dock, New York in 5-ton lots. Add 1 cent for 2240-11,199 lb, 1½c 1000-2239, 2½c 500-999, 3c under 500. Grade A, 99.8% or higher (includes Straits), 80.00c; Grade B, 99.8% or higher, not meeting specifications for Grade A, with 0.05% max. arsenic, 79.85c; Grade C, 99.65-99.79% incl. 79.55c; Grade D, 99.50-99.64% incl., 79.40c; Grade E, 99-99.49% incl. 78.90c; Grade F, below 99% (for tin content), 78.70c.

Antimony: American bulk carlots fob Laredo, Tex., 99.0% to 99.8% and 99.8% and over but not meeting specifications below, 33.00c; 99.8% and over (arsenic, 0.05% max.; other impurities, 0.1% max.) 33.50c, effective as of Mar. 15. On producers' sales add ¼c for less than carload to 10,000 lb; ½c for 224-9999 lb; add 2c for 223 lb and less; on sales by dealers, distributors, and jobbers add ½c, 1c, and 3c, respectively.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked 35.00c lb; 25 lb pigs produced from electrolytic cathodes 36.50c lb; shot produced from electrolytic cathodes 37.50c lb; "F" nickel shots or ingots for additions to cast iron 35.50c lb. Prices include import duty.

Mercury: Open market, spot, New York, $81-$84 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $17 per lb contained Be.

Cadmium: Bars, ingots, pencils, pigs, plates, rods, slabs, sticks, and all other "regular" straight or flat forms $1.75 lb, del.; anodes, balls, discs and all other special or patented shapes, $1.80.

Cobalt: 97-98%, $1.65 lb for 550 lb (keg); $1.67 lb for 100 lb (case); $1.72 lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Indium: 99.9%, $2.25 per troy ounce.

Silver: Open market, N. Y., 71.37½c, per ounce.

Platinum: $59-$62 per ounce.

Palladium: $24 per troy ounce.

Iridium: $80-$90 per troy ounce.

Rolled, Drawn, Extruded Products

(Copper and brass products prices based on 21.50c, Conn., for copper. Freight prepaid on 100 lb or more.)

Sheet: Copper 33.68c; yellow brass 29.63c; commercial bronze, 95% 33.72c, 90% 33.11c, red brass, 85% 31.99c, 80% 31.38c; best quality 30.64c; Everdur, Duronze, Herculoy or equiv., cold-drawn, 38.46c; nickel silver, 18%, 42.49c; phosphor bronze, grade A, 5%, 52.00c.

Rods: Copper, hot rolled 30.03c, cold drawn 31.03c; yellow brass, free cutting, 24.39c; commercial bronze, 95% 33.41c, 90% 32.80c; red brass, 85% 31.68c, 80% 31.07c; best quality 30.33c.

Seamless Tubing: Copper 33.72c; yellow brass 32.39c; commercial bronze 90% 35.52c; red brass 85% 34.65c, 80% 34.04c; best quality brass 33.05c.

Wire: Yellow brass 29.92c; commercial bronze, 95% 34.01c, 90% 33.40c; red brass, 85% 32.28c, 80% 31.67c; best quality brass 30.93c.

Copper Wire: Bare, soft, fob eastern mills, carlots 26.92c, less carlots 27.42c; weatherproof, fob eastern mills carlots 27.60c, less carlots 28.10c; magnet, delivered, carlots 29.75c-31.13c, 15,000 lb or more 30.00c-31.38c, less carlots 30.50c-31.88c.

Aluminum Sheets and Circles: 2s and 3s flats, mill finish, base 30,000 lb or more, fob shipping point. Actual transportation charges (not to exceed lowest carload rail freight rate) are deducted on orders for domestic delivery of 500 lb or more of one product to one destination. Widths from 12 in. and diameters from 9 in. to indicated maximum sizes. Prices, cents per lb, effective Jan. 30, 1947.

B. & S. Gage	Max. Width or Diam.	Sheet Base	Circle Base
0.0249"-7	48"	23.70	26.20
8-10	48"	24.20	26.70
11-12	26"	24.70	27.50
13-14	26"	24.90	27.90
15-16	26"	25.10	28.20
17-18	26"	25.40	28.60
19-20	24"	25.70	29.00
21-22	24"	26.10	29.50
23-24	24"	26.60	30.20
25	24"	27.10	30.90
26	24"	27.80	31.90
27	24"	28.50	33.00
28	24"	29.20	33.70
29	24"	30.00	34.70
30	24"	30.80	35.80

Lead Products: Prices to jobbers: Sheets, full rolls, 140 sq ft or more, 18.25c; add per hundredweight, 25c, 80 to 140 sq ft; 50c, 20 to 80 sq. ft; 75c, 10 to 20 sq ft and circles. Pipe: Full coils 17.50c; cut coils 17.75c. Lead Traps and Bends: List plus 42%.

Zinc Products: Sheet, 15.50c, fob mill, 36,000 lb and over. Ribbon zinc in coils, 14.50c, fob mill, 36,000 lb and over. Plates, not over 12-in., 13.50c; over 12-in., 14.50c.

Plating Materials

Chromic Acid: 99.75%, flake, fob Philadelphia, carloads, 21.00c; 5 tons and over 21.50c; 1 to 5 tons, 22.00c; less than 1 ton, 22.50c.

Copper Anodes: Base, 2000 to 5000 lb; fob shipping point, freight allowed: Flat untrimmed, 30.59c; oval, 30.09c; electrodeposited, 29.84c; cast, 29.59c.

Copper Carbonate: 52-54% metallic Cu, 50 lb bags, 26.50c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00c fob Cleveland.

Sodium Cyanide: 96-98%, ½-oz ball, in 100 or 200 lb drums, 1 to 400 lb, 16.00c, 500 lb and over, 15.00c, fob Cleveland; 1 cent less, fob Niagara Falls.

Nickel Anodes: Rolled oval, carbonized, carloads, 48.00c; 10,000 to 30,000 lb, 49.00c; 3000 to 10,000 lb, 50.00c; 500 to 3000 lb, 51.00c; 100 to 500 lb, 53.00c; under 100 lb, 56.00c; add 1 cent for rolled depolarized.

Nickel Chloride: 100-lb kegs, 22.00c; 275-lb bbls, 20.00c.

Tin Anodes: Bar, 1000 lb and over 92.50c; 500 to 1000 lb, 93.00c; 200 to 500 lb, 93.50c; less than 200 lb. 95.00c; ball, 1000 lb and over, 94.75c; 500 to 1000 lb, 95.25c; 200 to 500 lb. 95.75c; less than 200 lb, 97.25c, fob Sewaren, N. J.

Tin Chloride: Fob Grasselli, N. J., 625 lb bbls., price on application.

Sodium Stannate: To all consumers; in 200 or 500 lb drums, 49.50c; 100 lb, 50.50c; 50 lb, 55.00c; 25 lb, 57.50c.
To consumers other than automobile, radio and refrigerator makers: 1500 lb, 45.85c; 600 to 1400 lb, 48.50c.
To automobile, radio and refrigerator makers: 10,000 lb and over, 44.50c; 2000 to 9999 lb. 45.50c; 1000 to 1999, 46.50c; 600 to 999 lb. 48.50c.

Zinc Cyanide: 100-lb drums 36.00c, fob Cleveland; 35.00c, fob Niagara Falls.

Scrap Metals

BRASS MILL ALLOWANCES

(Based on 21.50c, Conn., for copper)
Prices for less than 15,000 lb fob shipping point. Add ¾c for 15,000-40,000 lb; 1c for 40,000 or more.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	19.125	19.125	18.375
Yellow brass	15.125	14.875	14.250
Commercial Bronze			
95%	18.000	17.750	17.250
90%	17.500	17.250	16.750
Red brass			
85%	17.250	17.000	16.500
80%	16.875	16.625	16.125
Best Quality (71-79%)	16.125	15.875	15.375
Muntz Metal	14.125	13.875	13.375
Nickel silver, 5%	16.125	15.875	8.063
Phos. bronze, A, B	20.000	19.750	18.750
Naval brass	14.500	14.250	13.750
Manganese bronze	14.500	14.250	13.625

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, fob shipping point, carload lots)

No. 1 copper 17.00, No. 2 copper 15.50-16.00, light copper 14.50-15.00, composition red brass 12.75-13.00, auto radiators 9.75, heavy yellow brass 9.00, brass pipe 10.00.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 18.00-18.25, No. 2 copper 16.50-16.75, light copper, 15.50-15.75, refinery brass (60% copper), per dry copper content less $5 smelting charge for brass analyzing 60 per cent or more, 12.625.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots or more)

Copper and Brass: Heavy copper and wire No. 1 16.00, No. 2 15.00, light copper 14.00, No. 1 composition turnings 10.00-10.50, mixed brass turnings 5.50-6.00, new brass clippings nom. 10.50-11.00, No. 1 brass rod turnings 9.00-9.50, light brass 5.00-5.50, heavy yellow brass 6.00-6.50, new brass rod ends 9.00-9.50, auto radiators, unsweated 8.50-9.00, cocks and faucets 8.00-8.25, brass pipe 8.00.

Lead: Heavy 11.50, battery plates 6.25-6.50, linotype and stereotype 12.25-12.50, electrotype 10.75-11.00, mixed babbitt 10.75-11.00, solder joints 15.50-16.00.

Zinc: Old zinc 5.00, new die cast scrap 3.50, old die cast scrap 2.00-2.50.

Tin: No. 1 pewter 50.00-52.00, block tin pipe 67.00-68.00, auto babbitt 40.00-42.00, No. 1 babbitt 40.00-43.00, siphon tops 40.00-42.00.

Aluminum: Clippings, 2S 8.00-8.50, old sheets 6.00-6.50, crankcases 6.00-6.50, borings and turnings 2.00-2.50, pistons, free of struts, 5.00-5.50.

Nickel: Anodes 16.00-17.00, turnings 12.50-13.00, rod ends 16.00-17.00.

Monel: Clippings 12.00-12.50, turnings 7.00-7.25, old sheets 10.00-10.50, rods 10.00-10.50, castings 9.00.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt. Steel	$38.00
No. 2 Heavy Melt. Steel	38.00
No. 1 Busheling	38.00
Nos. 1, 2 and 3 Bundles	38.00
Machine Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.00-33.50
Short Shovel Turnings.	34.50-35.00
Cast Iron Borings	34.50-35.00
Bar Crops and Plate	45.50-46.00
Low Phos. Steel	45.50-46.00
Punchings & Plate Scrap	45.50-46.00
Cut Structurals	45.50-46.00
Elec. Furnace Bundles.	43.50-44.50
Heavy Turnings	36.50-37.50

Cast Iron Grades

No. 1 Cupola	43.00-43.50
Charging Box Cast	40.00-40.50
Heavy Breakable Cast.	36.50-37.50
Stove Plate	34.50-35.50
Unstripped Motor Blocks	38.00-39.00
Malleable	49.50-50.50
Brake Shoes	35.00-36.00
Clean Auto Cast	40.00-41.00
No. 1 Wheels	44.00-45.00
Burnt Cast	32.00-33.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.50-42.00
R.R. Malleable	50.00-51.00
Axles	42.00-43.00
Rails, Rerolling	46.00-47.00
Rails, Random Lengths	44.00-45.00
Rails, 3 ft and under	47.50-48.00
Rails, 18 in. and under	49.00-49.50
Railroad Specialties	48.00-48.50
Uncut Tires	46.00-46.50
Angles, Splice Bars	47.50-48.00

CLEVELAND

No. 1 Heavy Melt. Steel	$38.00-38.50
No. 2 Heavy Melt. Steel	38.00-38.50
No. 1 Busheling	38.00-38.50
Nos. 1 & 2 Bundles	38.00-38.50
Machine Shop Turnings	33.00-33.50
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	33.50-34.00
Cast Iron Borings	33.50-34.00
Bar Crops and Plate	41.00-41.50
Punchings & Plate Scrap	41.00-41.50
Heavy Turnings	37.00-37.50
Alloy Free Turnings	34.00-34.50
Cut Structurals	41.00-44.00

Cast Iron Grades

No. 1 Cupola	46.50-47.50
Charging Box Cast	43.50-44.50
Stove Plate	43.00-43.50
Heavy Breakable Cast.	41.00
Unstripped Motor Blocks	41.00
Malleable	57.00-60.00
Brake Shoes	42.00
Clean Auto Cast	48.00-50.00
No. 1 Wheels	44.00
Burnt Cast	41.00-41.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	41.00-41.50
R.R. Malleable	57.00-60.00
Rails, Rerolling	50.00
Rails, Random Lengths	46.00-47.00
Rails, 3 ft and under	48.00-50.00
Cast Steel	48.00-48.50
Railroad Specialties	48.00-48.50
Uncut Tires	43.00-43.50
Angles, Splice Bars	48.00-50.00

VALLEY

No. 1 Heavy Melt. Steel	$40.00-41.00
No. 2 Heavy Melt. Steel	39.00-40.00
No. 1 Bundles	39.00-40.00
Machine Shop Turnings	34.00-35.00
Short Shovel Turnings.	34.00-35.00
Cast Iron Borings	34.00-35.00
Low Phos.	44.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.50-41.00

MANSFIELD

No. 1 Heavy Melt. Steel	$38.00-40.00
Machine Shop Turnings	35.00
Short Shovel Turnings.	36.00-37.00

CINCINNATI

No. 1 Heavy Melt. Steel	$37.00
No. 2 Heavy Melt. Steel	37.00
No. 1 Busheling	37.00
No. 1 Bundles	37.00
No. 2 Bundles	37.00
Machine Shop Turnings	31.00
Mixed Borings, Turnings	30.00
Short Shovel Turnings.	33.00
Cast Iron Borings	32.00

Cast Iron Grades

No. 1 Cupola Cast	47.00
Charging Box Cast	41.00
Heavy Breakable Cast.	40.00
Stove Plate	38.00
Unstripped Motor Blocks	38.00
Brake Shoes	35.00
Clean Auto Cast	46.00
Drop Broken Cast	50.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00
R.R. Malleable	57.00
Rails, Rerolling	46.00
Rails, Random Lengths	44.00
Rails, 18 in. and under	50.00

DETROIT

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.50-35.00
No. 1 Busheling	34.50-35.00
Nos. 1 & 2 Bundles	34.50-35.00
No. 3 Bundles	34.50-35.00
Machine Shop Turnings	28.50-29.00
Mixed Borings, Turnings	28.50-29.00
Short Shovel Turnings.	29.50-30.00
Cast Iron Borings	29.50-30.00
Punchings & Plate Scrap	40.00-40.50

Cast Iron Grades

No. 1 Cupola Cast	42.00-43.00
Heavy Breakable Cast.	35.00-36.00
Clean Auto Cast	42.00-43.00

BUFFALO

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	37.00-38.00
No. 1 Busheling	37.00-38.00
No. 1 & 2 Bundles	37.00-38.00
Machine Shop Turnings	30.50-31.50
Mixed Borings, Turnings	30.50-31.50
Cast Iron Borings	30.50-31.50
Short Shovel Turnings.	31.50-32.50
Low Phos	42.00-43.00
Elec. Furnace Bundles.	39.50-40.50

Cast Iron Grades

No. 1 Cupola Cast	40.00-41.00
Heavy Breakable Cast.	35.00-36.00
Malleable	52.00-55.00
No. 1 Wheels	41.00-42.00

Railroad Scrap

Rails, 3 ft and under	46.00-47.00
Railroad Specialties	47.00-48.00

PHILADELPHIA

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	39.00-40.00
No. 1 Busheling	39.00-40.00
No. 1 Bundles	39.00-40.00
No. 2 Bundles	39.00-40.00
No. 3 Bundles	37.00-38.00
Machine Shop Turnings	31.50-32.00
Mixed Borings, Turnings	31.50-32.00
Short Shovel Turnings.	31.50-32.00
Bar Crop and Plate	44.00-45.00
Punchings & Plate Scrap	44.00-45.00
Cut Structurals	44.00-45.00
Elec. Furnace Bundles.	43.00-44.00
Heavy Turnings	40.00-41.00

Cast Iron Grades

No. 1 Cupola Cast	46.00-48.50
No. 1 Machinery Cast.	48.00-50.00
Charging Box Cast	47.00-48.00
Heavy Breakable Cast.	47.00-48.00
Unstripped Motor Blocks	44.00-45.00
Malleable	58.00-60.00
Clean Auto Cast	48.00-50.00
No. 1 Wheels	48.00-49.00

NEW YORK

(Dealers buying prices, fob shipping point)

No. 1 Heavy Melt. Steel	$34.00
No. 2 Heavy Melt. Steel	34.00
No. 1 Busheling	34.00
Nos. 1 & 2 Bundles	34.00
No. 3 Bundles	33.00
Machine Shop Turnings	28.50
Mixed Borings, Turnings	28.50
Short Shovel Turnings.	30.00
Punchings & Plate Scrap	37.50
Cut Structurals	37.50
Elec. Furnace Bundles.	36.00
No. 1 Chemical Borings	24.50-25.00

Cast Iron Grades

No. 1 Cupola Cast	41.00
Charging Box Cast	41.00
Heavy Breakable	41.00
Unstripped Motor Blocks	38.50
Malleable	54.00-55.00

BOSTON

(Fob shipping point)

No. 1 Heavy Melt. Steel	$32.00
No. 2 Heavy Melt. Steel	32.00
Nos. 1 & 2 Bundles	32.00
No. 1 Busheling	32.00
Machine Shop Turnings	26.50
Mixed Borings, Turnings	26.50
Short Shovel Turnings.	28.50
Bar Crops and Plate	33.00-34.00
Punchings & Plate Scrap	33.00-34.00
Chemical Borings	27.00-28.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-44.00
Charging Box Cast	38.00-39.00
Heavy Breakable Cast.	38.00-39.00
Stove Plate	37.00-38.00
Unstripped Motor Blocks	35.00-36.00
Clean Auto Cast	40.00-42.00

CHICAGO

No. 1 Heavy Melt. Steel	$38.50-39.00
No. 2 Heavy Melt. Steel	38.50-39.00
Nos. 1 & 2 Bundles	38.50-39.00
No. 3 Bundles	36.50-37.00
Machine Shop Turnings	33.50-34.00
Mixed Borings, Turnings	33.50-34.00
Short Shovel Turnings.	35.50-36.00
Cast Iron Borings	34.50-35.00
Bar Crops and Plate	41.00-41.50
Cast Steel	41.00-41.50
Punchings	41.00-41.50
Elec. Furnace Bundles.	39.50-40.00
Heavy Turnings	38.00-38.50
Cut Structurals	41.50-42.00

Cast Iron Grades

No. 1 Cupola Cast	42.00-45.00
Malleable	42.00-45.00
Clean Auto Cast	42.00-45.00
No. 1 Wheels	42.00-45.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	40.00-40.50
Rails, Rerolling	46.00-46.50
Rails, Random Lengths	41.50-42.00
Rails, 3 ft and under	44.00-44.50
Rails, 18 in. and under	44.50-45.00
Railroad Specialties	43.00-43.50
Angles, Splice Bars	43.00-43.50

ST. LOUIS

No. 1 Heavy Melt. Steel	$39.00-40.00
No. 2 Heavy Melt. Steel	38.00-39.00
Machine Shop Turnings	32.00-33.00
Short Shovel Turnings.	33.00-34.00

Cast Iron Grades (Fob shipping point)

No. 1 Cupola Cast	42.00-43.00
Charging Box Cast	39.00-40.00
Heavy Breakable Cast.	35.00-36.00
Brake Shoes	40.00-41.00
Clean Auto Cast	42.00-43.00
Burnt Cast	35.00-37.00

Railroad Scrap

R.R. Malleable	54.00-55.00
Rails, Rerolling	45.00-46.00
Rails, Random Lengths	42.00-43.00
Rails, 3 ft and under	45.00-46.00
Uncut Tires	43.50-44.50
Angles, Splice Bars	43.00-44.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$34.00-35.00
No. 2 Heavy Melt. Steel	34.00-35.00
No. 1 Busheling	34.00-35.00
Nos. 1 & 2 Bundles	34.00-35.00
No. 3 Bundles	31.00
Long Turnings	24.50
Short Shovel Turnings.	26.00-27.00
Cast Iron Borings	25.00
Bar Crops and Plate	38.50
Cut Structurals	38.50

Cast Iron Grades

No. 1 Cupola Cast	41.00
Stove Plate	39.00
No. 1 Wheels	36.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	37.00
R.R. Malleable	42.50
Axles, Steel	39.00
Rails, Rerolling	41.00
Rails, Random Length.	39.00
Rails, 3 ft and under	41.00
Angles and Splice Bars.	41.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	*$22.00
No. 2 Heavy Melt. Steel	*22.00
No. 1 Busheling	*22.00
Nos. 1 & 2 Bundles	*22.00
No. 3 Bundles	*17.00
Machine Shop Turnings	*12.50
Bar Crops and Plate	22.00
Cast Steel	22.00
Alloy Free Turnings	12.50
Cut Structurals	22.00
Tin Can Bundles	17.00

Railroad Scrap

Axles	29.00
Rails, Random Lengths	23.50
Uncut Tires	30.50

* Fob California shipping point.

SEATTLE

No. 1 Heavy Melt. Steel	$22.00
No. 2 Heavy Melt. Steel	22.00
No. 1 Busheling	22.00
Nos. 1 & 2 Bundles	22.00
No. 3 Bundles	20.00
Machine Shop Turnings	13.50
Mixed Borings, Turnings	13.50
Punchings & Plate Scrap	23.50
Cut Structurals	23.50

Cast Iron Grades

No. 1 Cupola Cast	27.50
Charging Box Cast	22.50
Heavy Breakable Cast.	21.50
Stove Plate	23.00
Unstripped Motor Blocks	21.50
Malleable	27.50
Brake Shoes	27.50
Clean Auto Cast	27.50
No. 1 Wheels	24.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Railroad Malleable	27.50
Rails, Random Lengths	20.00
Angles and Splice Bars	21.50

LOS ANGELES

No. 1 Heavy Melt. Steel	$22.50
No. 2 Heavy Melt. Steel	22.50
Nos. 1 & 2 Bundles	22.50
Machine Shop Turnings	16.00
Mixed Borings, Turnings	15.50-16.00
Punchings & Plate Scrap	28.00
Elec. Furnace Bundles.	28.00

Cast Iron Grades

No. 1 Cupola Cast	35.00-36.00

BALE SHEET METAL SCRAP

Keep your Plant Shipshape

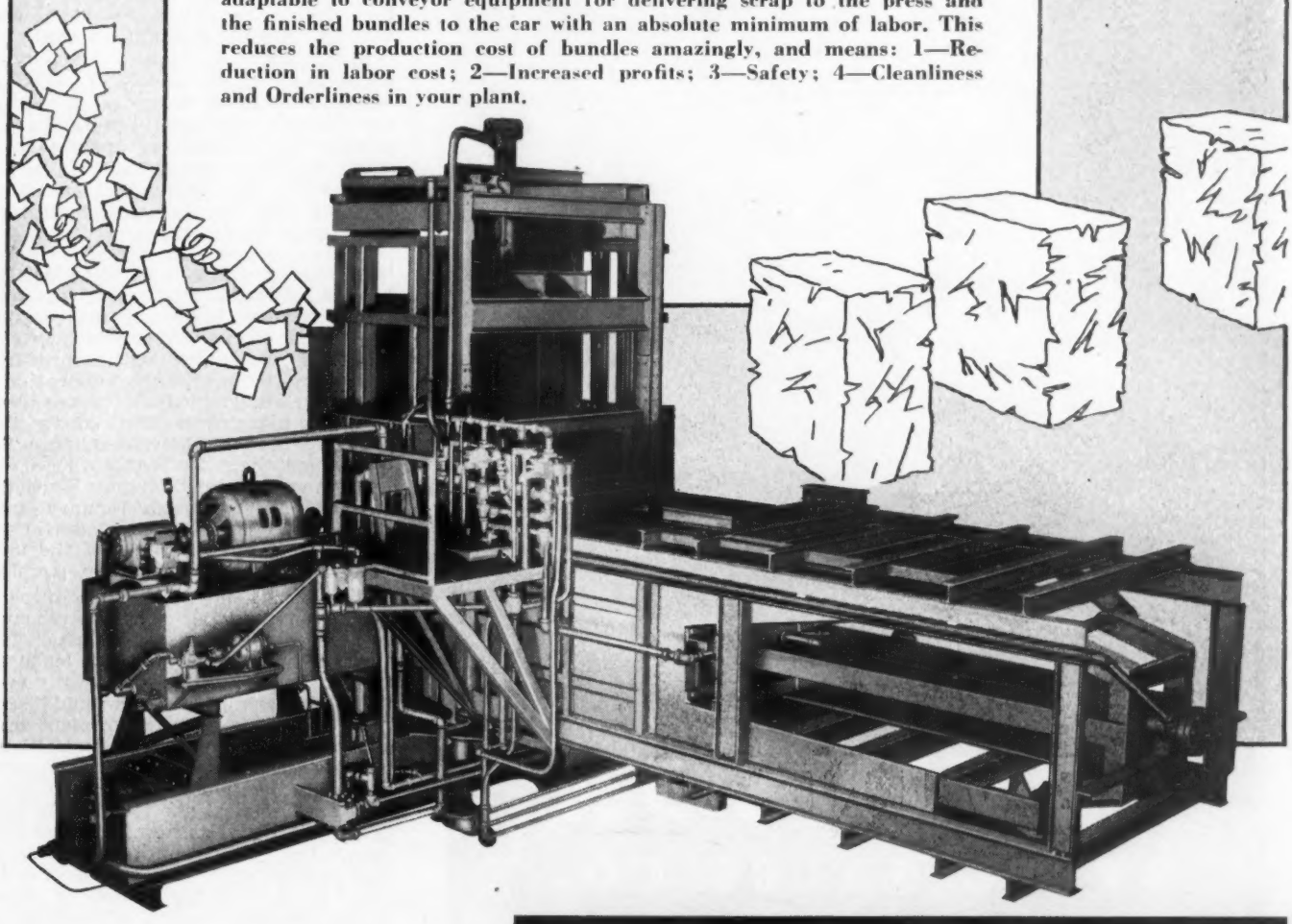
Today, as never before, the operator of sheet scrap baling presses must give ever greater attention to present and future margins of profit when installing capital equipment.

The Harris 4-A Baler is outstanding in its design. Every consideration is given toward lower initial and installation cost, as well as maintenance and operation. The following features are typical examples of the greater profit thought injected into the design of the Harris baler:

1. The vertically operating tramper door which means continuous operation in that a charge can be loaded while a bundle is being compressed.
2. The Harris 4-A baler is equipped throughout with micromatic honed cylinders which means perfect concentricity and extremely close tolerances. This greatly increases the life of all packings as well as the life of the machine itself and gives a smooth operation.
3. The Harris 4-A baler is equipped with Vickers vane type rotary pumps and outstanding control arrangement.

The Harris 4-A baler located adjacent to your railroad siding is easily adaptable to conveyor equipment for delivering scrap to the press and the finished bundles to the car with an absolute minimum of labor. This reduces the production cost of bundles amazingly, and means: 1—Reduction in labor cost; 2—Increased profits; 3—Safety; 4—Cleanliness and Orderliness in your plant.

Increase Profits

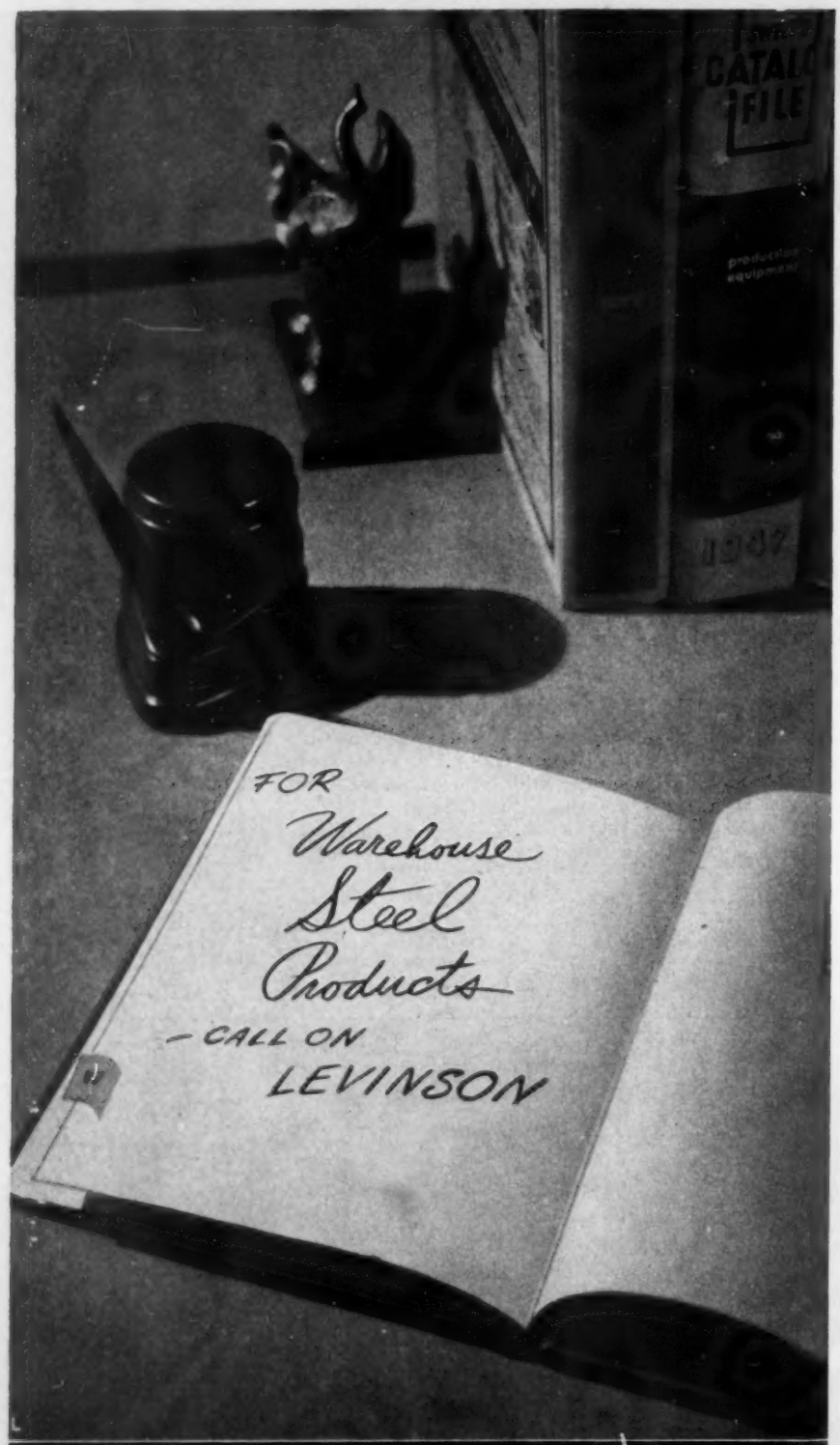


Harris Scrap Metal Baling Press Model 4 A

HARRIS FOUNDRY & MACHINE CO.

Reclamation Engineers Since 1889

CORDELE, GEORGIA



LEVINSON
STEEL SALES CO.
PITTSBURGH, PA.

ALSO DISTRIBUTORS OF PLASTEEL ROOFING, BATES OPEN STEEL FLOORING, THORN STEEL WINDOWS

Sheets, Strip . . .

Mill operations improve slightly. Freight rate rise will be reflected in price boost

Sheet Prices, Page 148

Philadelphia—Movement of sheets in this district is on a slightly increasing scale, reflecting improved mill operations. However, the great bulk of the tonnage now moving is against orders well overdue. In fact, most producers will not be caught up on their third quarter arrearages for another month or so and in at least certain instances not for another six weeks. All this explains the light quotas set up for new business this quarter.

As a result of the 10 per cent freight rate increase scheduled for Oct. 13, hot-rolled sheets delivered at Philadelphia will be 3.02c as against 3.00c while galvanized sheets will be 4.17c against 4.15c, the rate from the governing basing point, Sparrows Point, being 22 cents per 100 pounds. Cold-rolled sheets will be 3.97c, delivered Philadelphia, as against 3.93c, reflecting a 4-cent per 100 pound increase in the rate from Pittsburgh, the governing base. In other words, the freight rate will be 42 cents against 38 cents per 100 pounds.

Boston—Despite higher costs and necessary changes in shop practice in fabricating sheet steel, more users are resorting to substitutions. Aluminum is frequently utilized for small tanks, such as 275-gallon household units, and shops building this type of tank have also substituted light gage floor plates.

Some producers of hot-rolled carbon sheets have not yet firmly booked a pound of material for fourth quarter, being uncertain as to the extent of carryovers which in all instances are heavy. Other producers have reduced their allocations sharply. Small tank builders are also trying to place orders for high-tensile low-alloy stock, but some sellers will not accept them for that purpose.

Narrow cold-rolled strip mill schedules are filled through January and all volume offered for first quarter is not being entered because of the uncertainty in future hot-strip supply.

New York—No easing in deliveries on the major grades of sheets appears in prospect until some time after the turn of the year. Some trade leaders, in fact, doubt if there will be any appreciable easing before the middle of next year. The only betterment appears to be in some of the specialties, notably stainless sheets, which are generally available in four to five weeks. Electrical sheet supply is improving a little, as new facilities are completed. However, deliveries are still rather tight. One producer, selling on a monthly basis, is now booked up until the end of January.

New York delivered prices on hot-rolled sheets and galvanized sheets are 3.12c and 4.27c, respectively, reflecting an increase in the freight rate from Sparrows Point. The new delivered price on cold-rolled sheets is 4.00c, compared with 3.96c previously.

Chicago—Demand for all grades of flat-rolled steel continues unabated,

despite the fact that output holds at a very high level. Sheet and strip makers are unable to make any dent in backlogs and yearend carryovers are going to be in unprecedented volume. Producers in this district are not reducing fourth quarter consumer quotas, instead are meeting them as fully as possible. One mill estimates its yearend carryover may be equivalent to close to three months' production. Probability is strong that quotas for 1948 will be set on a quarterly basis instead of six months as in 1947 and that unrolled tonnage will be canceled, giving the customer option of reinstating his carryover or placing new orders against his quota.

Cincinnati—District sheet mills are maintaining production at a high level against a fourth quarter schedule which is so packed that a considerable carryover will be carried into the new year. Some revisions in quotas, as they were fixed in the third quarter, were made but all indications are that these were modest. Booking policies for next year have not been announced. Pressure for tonnage is without letup.

Birmingham—Sheets continue to flow at a substantial rate this quarter. A great deal of the tonnage, however, is involved in orders accepted for earlier delivery. Result is that application of tonnage to new quotas necessarily will be restricted. Producers report no slackening in demand for sheets. Conversion of the Fairfield mill from hot to cold-rolled sheets will add some 130,000 tons annually to the district's output.

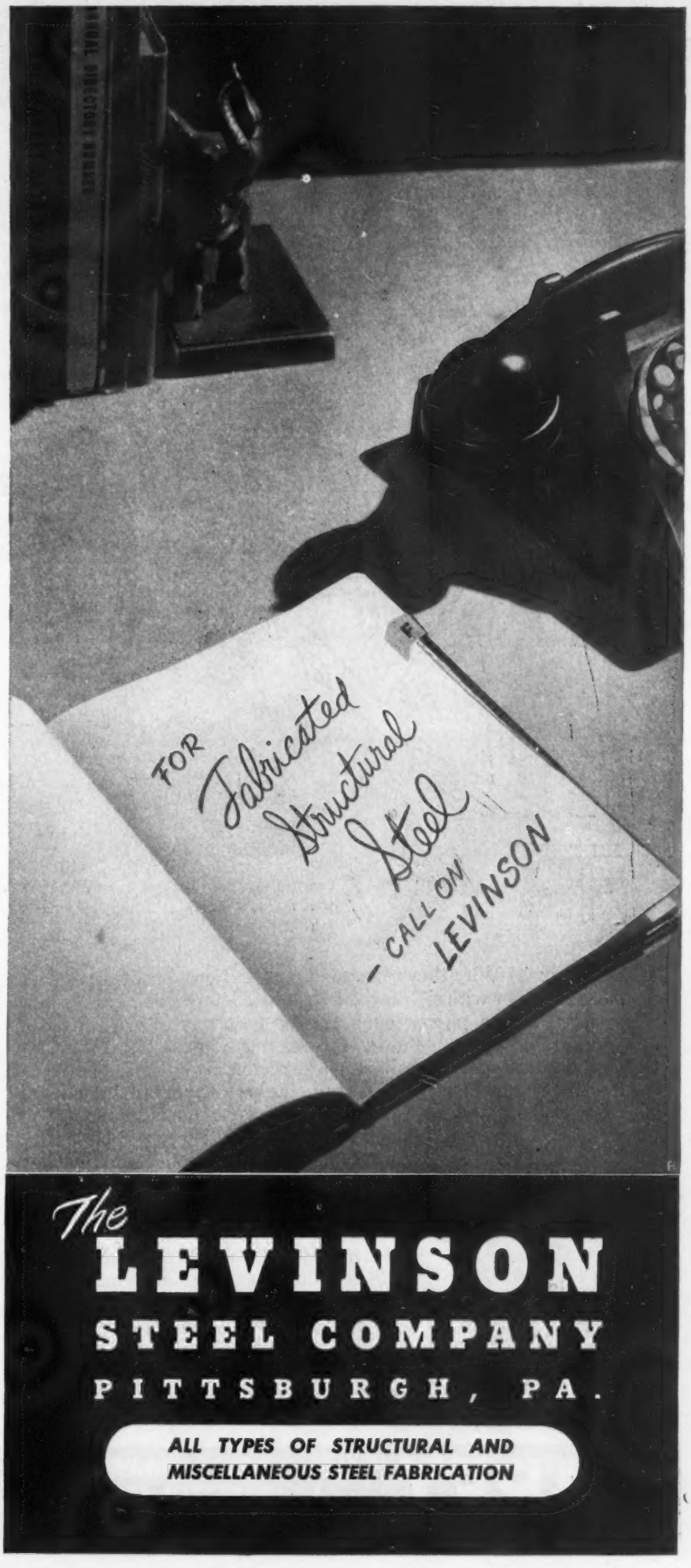
St. Louis—Supply of cold-rolled sheets promises to improve substantially here next month upon completion of Granite City Steel's new cold finishing mill after numerous setbacks. New mill's capacity will be 25,000 tons a month, but operations will be at an 18,000-ton rate indefinitely due to a shortage of hot coils. This, however, will increase present output of 18 gage cold-rolled sheets and lighter 250 per cent. Allocations of tonnage for the mill will be issued in November. Despite the expansion, local demand still will far exceed flat steel production. Mills have attempted to get current by the first of the year but substantial carryover is expected nevertheless. Books have not been opened for nearly a year and fabricators have operated on a curtailed basis as a result of steel shortages.

Plates . . .

Plate Prices, Page 149

New York—Pressure for plates shows little or no let-up, although actually little new tonnage is being placed because sellers generally are sold out for the remainder of this year, with prospects for a substantial carryover into 1948, and are accepting nothing for beyond. It will probably be a few weeks before producers open their books for new tonnage for next year's delivery. Incidentally, some leading car builders claim they are in greater need of plates at this time than any other product, even including sheets.

Based on a new rate of 32.00c from Sparrows Point, the New York deliv-



ered price on plates will be 3.27c.

Boston—Carryovers into the first quarter will be substantial with most plate mills; repairs to equipment are contributing to this situation. No immediate improvement in the supply of light gage plates, ¼-inch and under, is in sight and small tank builders' schedules are affected. Some producers also are getting behind delivery schedule on high-tensile low-alloy deliveries. Heads and flanged parts are being allocated in some cases, although deliveries of pressed heads, 48-inch and under, when dies are available, range from six to eight weeks. Spun heads are further extended with schedules filled through this year.

Philadelphia—The 10 per cent increase in freight rates, effective Oct. 13, will bring the Philadelphia delivered price on plates up to 3.17c, against 3.15c, as a result of the advance of 2 cents per 100 pounds in the rate from Sparrows Point, the governing point.

Pressure for plates continues strong, with producers generally having little to offer over the remainder of this year. Meanwhile, sellers are taking no new orders for shipment beyond the first of the year, although most of them will have a carryover of at least a month or so, judging from the present outlook.

Birmingham—Postwar demand for plates in this section shows remarkable tenacity. One major source of demand is from expanded car-building activity at Bessemer, along with considerable demand from tank manufacturers and for floor plates. Backlogs are still considerable.

St. Louis—Plate production in this district has risen from about 15 per cent of total flat steel capacity to 25-30 per cent, largely because some customers are furnishing raw materials. Pressure from the transport, oil and tankmaking industries is heavy. Carryover probably will extend through the first quarter. Considerable capacity was diverted for some months into plate for a 100-mile emergency natural gas pipeline, but this was completed in September.

Seattle—Demand for plates exceeds present supplies. Consequently, shops are inclined to accept jobs involving small tonnages, as for larger projects steel is not available. Operations are fair.

Tin Plate . . .

Tin Plate Prices, Page 149

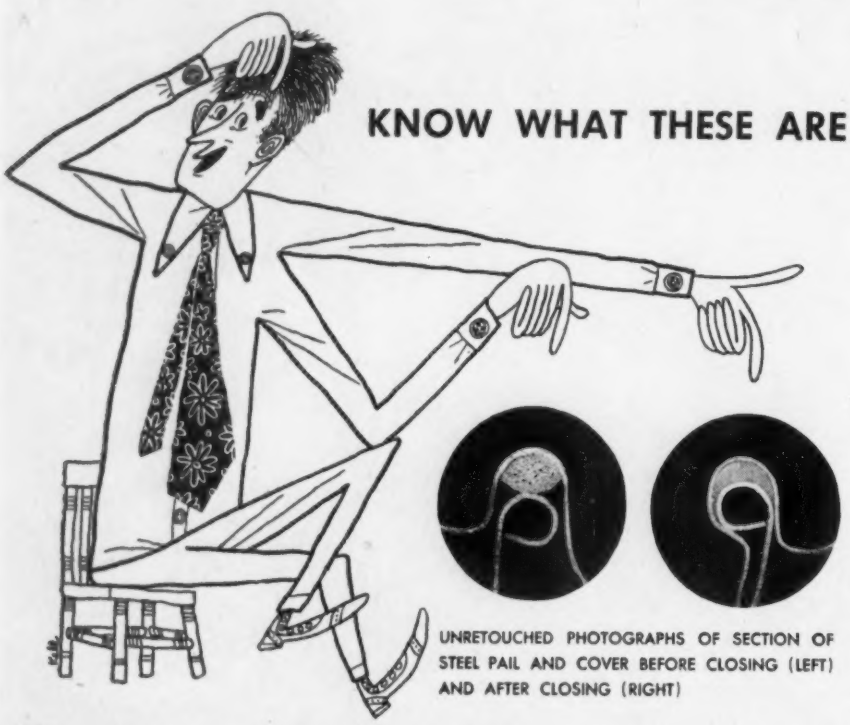
Pittsburgh—First quarter mill export quotas are expected to be established early this week when the Tin Plate Industry Advisory Committee is scheduled to meet in Washington. Some increase in these allotments is anticipated by some trade authorities, although this opinion is not held by all. Sellers expect a moderate carryover tonnage in tin plate by close of this year unless some adjustment in customers' allotments is made during the closing months. Tin plate shipments again are adversely affected by the box car shortage, although substantial tonnage is being moved by truck, flat and gondola cars. Scheduled advance in rail freight rates has, in some instances, placed truck rates on a favorable basis with rail shipment.

Chicago — Demand for tin plate continues exceedingly heavy and, although production holds steady up to the limit of steel allocated to the product, it is impossible to satisfy the requirements of consumers. Notwithstanding growing shortage of box cars, tin plate makers so far have been able to ship without more than momentary delay. Export orders continue to be placed at a good rate, this of course being under government regulation. Rumors are current here that export quotas for 1948 are to be increased substantially.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 148

Pittsburgh—New inquiries for bridges, highways and housing construction are holding up very well, although many of these projects have been temporarily shelved due to extended mill deliveries and the fact that construction costs frequently exceed appropriations. There has been no significant revision in mill tonnage allotment for monthly concrete bar output this quarter. Customers' allotments have been reduced, however, in proportion to their share of the mill carryover tonnage which is said to range between 2 and 3 weeks' output in most instances. Fabricating activity continues limited only by



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inadequate supply of steel which has resulted in badly unbalanced inventories. The same situation is prevalent among the rerollers.

Seattle — Capacity operations are reported by rolling mills which cannot meet current demands for both merchant and reinforcing bars. For this reason contractors find it impossible to bid on some sizable jobs. New commitments about equal production so that producers are making little headway in reducing backlogs.

Fourth-Quarter Steel Export Quotas Total 557,150 Tons

Washington—Office of International Trade, Department of Commerce, has established export quotas totaling 557,150 tons of steel mill products to be licensed during the fourth quarter. All presently approved steel requirements of various special projects abroad of vital interest to the United States are included for the first time. Export quotas for the fourth quarter follow in short tons:

Sch. B No.	Commodity	Tons
601609	Steel sheet bars & tin plate bars	1,000
602000	Steel bars, CF 1" & under	8,250
602200	Concrete reinforcing bars	45,000
602300	Other steel bars, nonalloy 1" & under	35,000
602906	Wire rods	12,800
603000	Boiler plate	111,600
603110	Other plate, ex. fabricated	
603300	Iron sheets, galv.	20,000*
603400	Steel sheets, galv.	
603510	Steel sheets, black ungalv.	90,000
603600	Iron sheets, black	
603711	Iron & steel strip, cold-rolled, nonalloy	7,500
603811	Iron & steel strip, not rolled, nonalloy	15,500
604200	Terneplate, incl. long ternes	2,000
604500	Angles, channels, & beams, 6" & under	33,000
606200	Casing & oil-line pipe, seamless	40,000
606300	Casing & oil-line pipe, welded	50,000
606400	Seamless black pipe, ex. casing & oil-line	2,500
606500	Malleable iron pipe fittings 150# and under	5,000
607798	Couplings (etc)	
606705	Cast-iron pressure pipe	9,000
606795	Cast-iron pressure pipe fittings	
607000	Welded black pipe, steel	25,000†
607100	Welded black pipe, wrought iron	1,500
607300	Welded galv. pipe, wrought iron	
607200	Welded galv. pipe, steel	13,000
608100	Iron & steel wire, uncoated	21,000
609200	Wire nails	8,500
609500	Other nails	

* Licenses to be limited so that no more than 25 per cent of quota will be in gages 22 and lighter. † Licenses to be limited so that no more than 40 per cent of the quota will be for butt and lap-welded pipe.

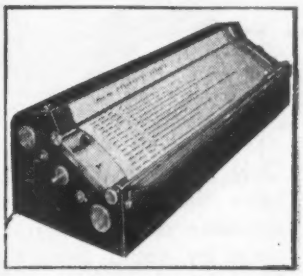
Tubular Goods . . .

Tubular Goods Prices, Page 149

Pittsburgh — No significant improvement in line pipe supply is indicated for months to come, with some interests booked into 1951. More pipe could be produced for gas transmission lines, if the demand for oil country goods or standard pipe should decline, but there is little prospect of this development in the foreseeable future. The additional tonnage that might result from such a development, however, would not be large. The tubular goods industry, as now constituted, operating on a fulltime basis and unhampered by strikes or shortages, can produce some 6 million tons per year. Additional pipe mill capacity requires large capital investment, and in order to be utilized under present circumstances, would necessitate additional steelmaking facilities. Most of the increased pipe production facilities built in recent years have been for the production of trunk pipe lines. One company on the West Coast has installed equipment for fabrication of large diameter pipe from plate, and another similar mill is scheduled for the Birmingham area. These mills are dependent on new steelmaking facilities built during the war, so production from them represents a net addition to tubular production. The spread between supply and demand for drill pipe has narrowed in recent months.

Seattle—Inquiry for cast iron pipe is slow, due in great measure to uncertain and long deferred deliveries. Shipments en route are aboard ships tied up by strikes in California ports. Delivery of new business is specified now at 18 months or less. Cast iron pipe agencies are under a decided handicap and due to present conditions have lost some business to competing types of pipe. However, many cities in this area have plans prepared and bids will be asked as soon as supply and delivery problems are solved.

New Automatic Device Provides Up-to-the-Minute Visual Record



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Steel Bars . . .

Bar Prices, Page 148

Boston—While deliveries on hot-rolled carbon bars this quarter will be at about the same level as in the third quarter, new volume booked for this period is generally lower. The effect of production losses by one producer and the failure of another to issue allocations for the final three months of this year has tightened the supply. Most mills are now seeking orders on popular ranges in cold-finished bars and alloys. Forge shops are booking more orders and note some temporary improvement in bar supply, although this is primarily the case with shops forging a high ratio of alloys.

A leading consumer in Maine is offering about 600 tons of miscellaneous steel, including bars. Alloys and special stock make up the list for the most part, although some carbon bars are included. Changes in production and practice makes this stock surplus and is illustrative for the unbalance in inventories frequently encountered.

New York—Apart from the large sizes, producers of hot-rolled carbon bars are entirely booked up over the remainder of the year and in one or two instances at least they are also out of the market on the large bar specifications. Demand continues highly diversified, with special pressure for small rounds and flats. Except for cold-drawn bars and alloy bars, sellers have shown no disposition to book tonnage beyond the remainder of this year; and as for cold-drawn and alloys, mills can still accept shipments for 1947.

As a result of the 10 per cent freight rate increase, effective Oct. 13, the delivered price on hot carbon bars will be 3.35c.

Pittsburgh—Cold-finishers report a slight reversal in recent downward trend in new orders, due to fact that customers' inventories are in better balance with current production schedules. It is also noted that in some instances customers' production schedules have improved reflecting upturn in production among prime contractors resulting from more balanced steel inventories. Large cold-finished carbon rounds are available for delivery within 4 to 6 weeks, although smaller bar sizes, such as narrow flats, are extended into January. Alloys, both hot-rolled and cold-finished, are available for relatively prompt delivery, although shipment schedules also are further extended among the smaller sizes. Except for the brief period during the railroad strike, mill deliveries of carbon bars have been fairly well sustained. Most cold-finishers are operating near capacity with carbon bar inventories in fairly good balance.

Philadelphia — Hot-rolled carbon bar demand continues brisk here, especially for the small and medium sizes. Most mills are still shipping against arrearages, although some will be fairly caught up by the end of this month on third quarter delivery promises. Large carbon rounds are not too active, especially with the larger shops looking for business.

The 10 per cent increase in freight rates will bring the price on hot-rolled carbon bars up to 3.32c, delivered Philadelphia, against 3.28c previously.

St. Louis—Scarcity of merchant bars increases, although mills have had customers on allocations many months. Orders are current now and deliveries on time, but only because consumers agreed to cancel old orders and accept new allocations. Specifications are being requested in the month preceding each rolling. One producer is considering reducing merchant bar output still farther and giving preference to other products such as strip, pipe, wire and joists. It complains its bar plant cannot get enough billets from present ingot capacity and none can be bought in the open market. Present bar output does not exceed 1000 tons a month. Should a curtailment occur it would affect mainly bars in the ⅜ to 2-inch diameters, inclusive.

Wire . . .

Wire Prices, Page 149

Boston—There is a slight improvement in wire rod supply. This is more evident in high-carbon grades than in low-carbon. On some high-carbon finished wire, mills are holding even with backlogs, but are not breaking even on low-carbon. Demand for wire is heavy with few exceptions and consumer inventories as a rule are out of balance. This is especially true of screw stock and there is no slackening in overall demand for heading

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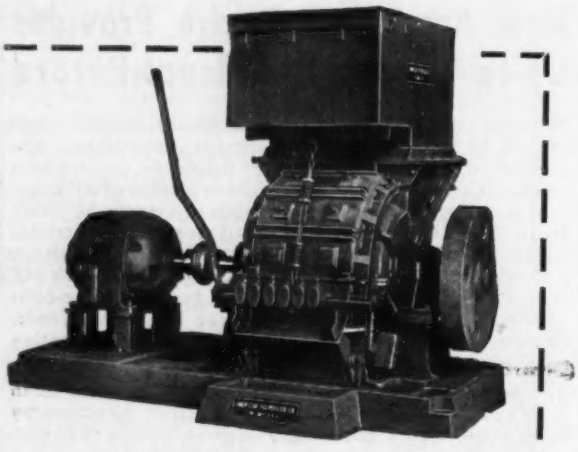

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wire. Some wire rod tonnage is being received from the midwest. Stapling wire requirements are running far in excess of prewar demand. Wire mill schedules are filled into next year and would be heavier if producers could be sufficiently well balanced ahead in semifinished material.

Chicago—Consumer requirements for wire in all categories continue far beyond the ability of producers to supply in spite of the fact that current production is at high level. This applies to merchant items as well as manufacturers wire and construction products. Manufacturers of consumer goods, such as furniture and bedding, for example, are obliged to limit production schedules to quantities of wire obtainable. Shortages in merchant items are most acute in building nails, barbed wire, fencing, fence posts and bale ties and baling wire.

Birmingham—Demand for wire products apparently will continue indefinitely at a level in excess of available supply. Especially is this true of agricultural wire products, such as fencing and baling wire, although the situation is scarcely better in other products. Some moderate expansion plans have had to be shelved because of the wire shortage.

Structural Shapes . . .

Structural Shape Prices, Page 149

New York—Newport News Shipbuilding & Dry Dock Co., Newport News, Va., recently entered the lowest of four bids to the Maritime Commission for the construction of five 15,000 gross ton passenger-cargo vessels.

Bids on the vessels, the first major American merchant ships planned for construction since the war, ranged from $9,690,000 to $17,620,416 a ship. Other bidders comprised the New York Shipbuilding & Dry Dock Co., Camden, N. J.; Ingalls Shipbuilding Co., Birmingham, Ala., and Bethlehem Steel Co., Bethlehem, Pa.

With a rate of 22 cents per 100 pounds from Bethlehem, Pa., the New York delivered price on shapes will be 3.02c.

Pittsburgh—A proposed $30 million super-highway between Oklahoma City and Tulsa, Okla., is expected to result in orders for up to 38,000 tons of steel for mills in this district. Local mills are reported to have agreed to provide this steel, although it will be some time before the highway program plans will have reached the point to make definite commitments. Sellers are unable to make any progress against order backlogs, and there is little indication that the heavy volume of new inquiries will subside for months to come. Carryover tonnage alone represents 3 to 4 weeks' output. Fabricators continue to operate below capacity due to inadequate steel supply, and also are well behind delivery promises for same reason.

Boston—While new inquiry for fabricated structural steel is light, volume involved is in excess of the amount of plain material available. Fabricating shops are held to limited quotas and warehouse inventories are low, notably in smaller sizes. This makes it difficult to round out requirements with fill-in tonnage. Bridge inquiry is light involving small tonnages only.

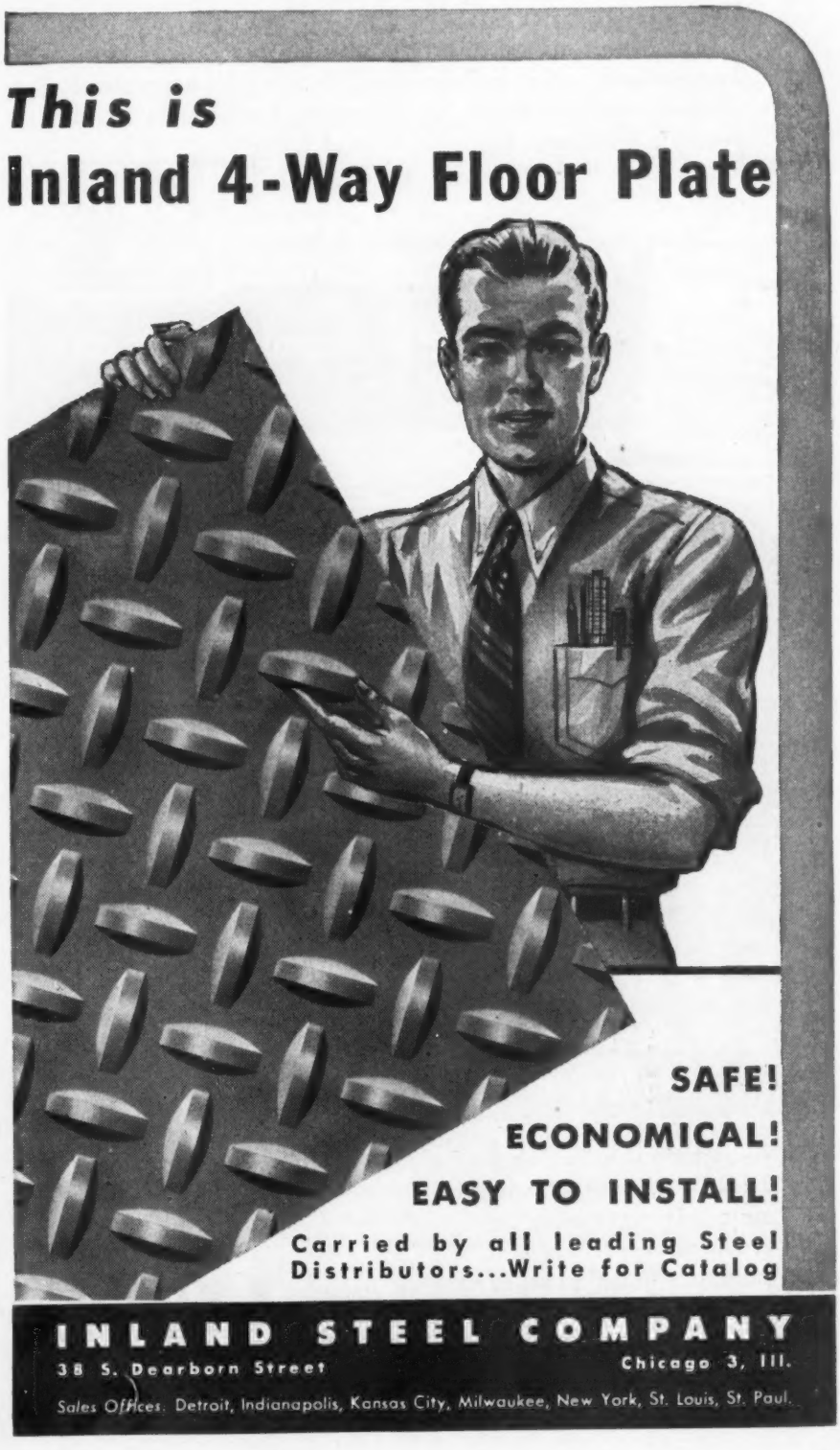
Contracts placed include 1100 tons for a power plant extension at West Springfield, Mass.

Philadelphia—As a result of the 10 per cent increase in freight rates, effective Oct. 13, the delivered price on shapes here will be 2.95c as compared with 2.94c. In other words, the increase in freight from Bethlehem, Pa., the governing base, to Philadelphia will be 15 cents per 100 pounds. Demand for structurals is fairly brisk with several fair sized projects pending.

Chicago—New large inquiries for fabricated structural steel are coming out at a slower pace than that in recent weeks. However, fabricating shops are deluged with small jobs involving less than 100 tons each. Fabricators are booked for months ahead but run into difficulty in getting plain shapes in quantity and sizes to keep production flowing smoothly. On the smaller jobs, buyers frequently abandon the customary procedure of seeking bids. Instead they ask for quotations, and quickly follow up by placing an order.

Birmingham—Shape tonnage remains comparatively moderate in this section. In recent weeks, several bids have been in excess of appropriations with the resulting in temporary shelving of construction.

Seattle—Fabricating plants could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Pig Iron . . .

Pig Iron Prices, Page 150

Boston—Larger consumers are better supplied with pig iron than the smaller ones. Some foundries have been able to increase the ratio of iron to scrap in melt mixtures, although few approach normal differentials. Most heavier melters have and are increasing capacity substantially. This includes most textile mill equipment shops and one pipe-fitting foundry in the Providence, R. I., district. By installation of a continuous unit, this consumer is increasing his melt capacity from 55 to 165 tons daily. Although there are exceptions, and most basic users are operating on close margins, overall foundry melt is off slightly accounting for a mild easing in pressure for iron.

Prewinter inventories are small, however, and prospects for more tonnage from outside furnaces over the balance of this year are slim. Some malleable iron has been shipped to Connecticut from the Erie, Pa., district.

New York—Pig iron consumers continue to report difficulty in obtaining adequate supplies, with the probability that their melts this month will average less on a day-to-day basis than in September. In fact, some report that the trend has been steadily downward since late summer. Taking into account the vacation season which fell heaviest in July, the trend has actually been down since June.

Pittsburgh—Some gray iron foundries report a definite downward trend in order backlogs, although some consider this situation to be only temporary and attribute it to the unbalanced inventory position in other steel items and components among metalworking companies. Foundry operations, however, continue restricted only by limited pig iron supply. Even should current easing in demand for gray iron castings continue, pig iron requirements are expected to remain at present high level for months, for most foundries' iron stocks are badly depleted and many would take advantage of the opportunity to build up inventories to the normal 30-day level. Some foundries have been forced to shut down for short intervals due to inadequate supply of pig iron.

Carnegie-Illinois Steel Corp. recently blew in the No. 2 Carrie furnace at Rankin, Pa., making 45 out of 46 units pouring iron in this district.

Chicago—Foundries maintain their pressure for pig iron and are forced to gear their production of castings to quantity of iron they can obtain. Output of iron in this district continues at the highest rate in history with 41 of 42 blast furnaces operating, yet the supply of merchant iron is inadequate because steel mills are

using an abnormal proportion of furnace output as hot metal to keep steelmaking operations at approximately 95 per cent of capacity. Were scrap in more generous supply for both steelmaking and foundry use, the iron situation might be far different.

Buffalo—Hopes for immediate relief in the tight merchant iron market have been jolted as about 15,000 tons have been lost through the continued idleness of a blast furnace which was banked about a month ago because of inadequate coke supplies. With the stack idle, output is falling far short of filling current requirements. Further aggravating the foundry situation is the sustained heavy drain on output for ingot production. Many foundries are curtailing melt.

The building boom is reflected in a brisk demand for heating castings.

Cincinnati—Furnace interests foresee an unchanged rate in shipments of pig iron during the remainder of this quarter. This tonnage, of course, is far below district requirements. Melters have relaxed pressure on furnaces as if they had come to realize futility of appeals for more tonnage. Foundry oven coke is easier, hence the pinched supply of iron is now the only barrier to an increase in castings production.

Birmingham — Merchant pig iron production in this district remains considerably below current and prospective needs. However, some foundry interests report a definite leveling-off process. Cast iron pipe producers stand in urgent need of all the iron they can obtain, and they are shopping at every imaginable place to piece out their requirements.

St. Louis—Pig iron production continues steady at the 1000-ton a day capacity mark at the Koppers furnaces. The company is reported having difficulty getting adequate quality coal for coke, but the winter's supply of ore is in. Operations have been steady since repairs were completed three months ago.

Iron Ore . . .

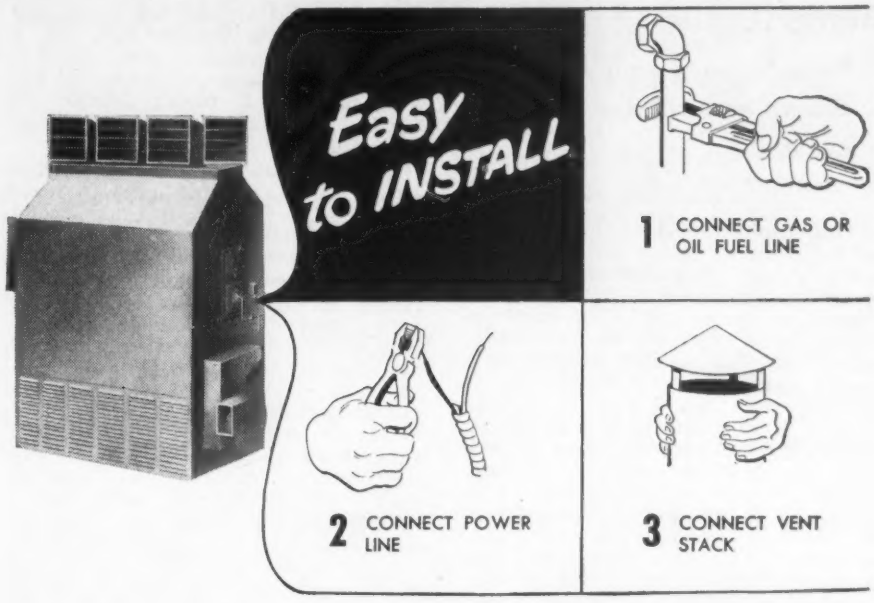
Iron Ore Prices, Page 150

Cleveland—Shipments of Lake Superior iron ore increased 18,439 927 tons, or 42.63 per cent, this season through September to a total of 61,-699,561 tons compared with 43.259,-634 tons in the like 1946 period, according to the Lake Superior Iron Ore Association. Of this year's total, United States ports accounted for 60.427 500 tons compared with 42,-327,387 in the like 1946 period.

September shipments totaled 10,-684,778 tons, or an increase of 1,048,-425 tons over the September, 1946, total, of which United States ports accounted for about 97.8 per cent.

Details of the movement by ports are as follows:

Port	Sept., 1947	Sept., 1946
Escanaba	473,568	529,021
Marquette	632.321	377,940
Ashland	736.030	469,981
Superior	3.322.146	3.229,992
Duluth	2.938,695	2.698,369
Two Harbors	2.347,128	2,113,546
Total U. S. Ports	10,449,888	9,418,849
Michipicoten	46,284	64,249
Port Arthur	188,606	153,255
Total Canada	234,890	217,504
Grand Total	10,684,778	9,636,353



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Scrap . . .

Prices move sharply higher in eastern districts due to heavy demand

Scrap Prices, Page 154

Philadelphia — Under pressure of active demand, heavy melting steel scrap prices advanced sharply last week to a range of $39 to $40, delivered, compared with the previous quotation of $37. In fact the new spread applies to all steelmaking grades down to and including No. 2 bundles, with No. 3 bundles at $37 to $38. Most other grades of scrap, including cast material, also moved upward. Machine shop turnings, mixed borings and turnings, and short shovel turnings advanced $1 to $31.50 to $32. Bar crops and plate, punchings and plate scrap, and cut structurals moved up to $44 to $45, delivered, and heavy turnings to $40 to $41.

No. 1 machinery cast was quoted $48 to $50, delivered; cupola cast, $46 to $48; charging box and heavy breakable cast, $47 to $48; unstripped motor blocks, $44 to $45; malleable, $58 to $60; clean auto cast, $48 to $50; and No. 1 wheels, $48 to $49.

New York—Brokers' buying prices here have advanced $2 to $34 fob shipping point on Nos. 1 and 2 heavy melting steel, No. 1 busheling and Nos. 1 and 2 bundles, with No. 3 bundles also up $2 to $33. Machine shop turnings and mixed borings and turnings are now $28.50, short shovel turnings $30, punchings and plate scrap and cut structurals $37.50 and electric furnace bundles $36. No. 1 cupola cast, charging box cast and heavy breakable are all higher at $41 and unstripped motor blocks at $38.50. Demand is active in all directions.

Pittsburgh — Despite a concerted effort on the part of mills to force scrap prices lower, a considerably stronger belief is developing that the future price trend will be upward. Very few new orders have been placed recently at the $38 level for heavy melting and these involved only small lots. Dealers and brokers are finding it increasingly difficult to cover old $38 orders. Based on quotations in other districts, shipments of remote scrap here would range between $41 and $45 for heavy melting steel. Mills appear to be in no hurry to re-enter the market since inventories are being sustained by shipments under old orders while influx of material on a reciprocity basis is holding up well. However, collection and segregation of scrap by yards have fallen off considerably in recent weeks and crushers report inadequate supply of turnings is forcing them to operate well below capacity. Further slowing up in collection and segregation of scrap is indicated over coming months with advent of winter.

Awards are expected to be announced soon on the latest B. & O. railroad list. Rumors are to the effect that bids as high as $44.50 for heavy melting scrap, fob tracks, were made. Pennsylvania railroad closes Oct. 14 on 25,770 tons of iron and steel scrap.

Boston—There is a shortage of strictly top-grade No. 1 heavy melting steel scrap here and doubt is expressed that higher prices would bring out more tonnage of this character. Surveys indicate this grade is nonexistent in volume. Steelmakers producing for wire are plagued with alloys, being the effect of heavier use of alloys during the war. Movement of scrap to yards is slow and considerable industrial material is not coming into the open market. Larger consumers of cast grades have built larger inventories. Pricewise there were few changes last week.

Chicago—Scrap prices in this market continue unchanged but a feeling prevails that a good test price is close at hand. A stronger undertone is noticeable and any attempt by steel mills to obtain large tonnages would exert a tendency for higher prices. Up to the present, however, consumers decline to offer more than $39 a ton delivered, including commission, and sellers are unwilling to consider anything except short term commitments. With cold weather and the period of declining activity in scrap collection not far away, it would seem that consumers can not long delay committing themselves for future supplies of melting material.

Buffalo—Steady to firm tendencies rule the scrap market here. Recent stalemate has been broken by new sales of No. 2 heavy melting and bundles, aggregating about 10,000 tons, at the old range of $37 to $38. Dealers' hopes for higher prices were hit when one yard, which had completed deliveries on old contracts, accepted additional tonnage at the previous range. Another dealer promptly followed suit. In some instances, it was admitted that dealers were holding back for increased prices. It was intimated, too, that some sales may be delayed for yearend tax purposes.

With dealers experiencing little difficulty in covering old orders, mills have built up winter stockpiles to the best level in five years. Favorable weather has spurred local collections. A flurry is also taking place in water receipts as the current navigation season nears its close. Approximately 10,000 tons arrived from the east via the canal while a 5000-ton boatload was expected on the lakes from Duluth.

Detroit — So-called "uncontrolled" grades of iron and steel scrap are being pushed to higher levels in a boiling market, although steel grades are being held in line at $35 per ton, dealers' buying price. Cast items are particularly strong, No. 1 cupola, for example, being quoted at a top of $43 per ton, highest price in many years. Borings and turnings are up $1 per ton, electric furnace material up 50 cents a ton to better than $40. Plans of Ford Motor Co. to double pig iron capacity by construction of a new 1400-ton furnace, to be operating next fall, are too far off to exert effect on scrap, even though the move will take the company out of the scrap market. The 10 per cent increase in freight rates, likely to go into effect this week, will be reflected in the delivered prices of scrap, although the extent has not yet been determined.

Cleveland—Scrap market was in-

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active here last week with prices holding steady. Shipments have fallen off steadily in recent weeks, forcing some mills to draw moderately on reserve stocks. Rejections are increasing and this is attributed in part to the shortage of material which has forced some interests to ship inferior material in order to fulfill commitments. Contamination by alloys also has been noted for the first time in many months, indicating an increased substitution of this type of steel for carbon grades. Brokers anticipate a heavier buying movement after mid-October.

Cincinnati—Although scrap prices are unchanged, market interests continue to comment on the strong undertone. Mills avoid tonnage buying when such purchasing might incite an upward price move, and are obtaining some tonnage on reciprocal agreements. A few dealers are holding modest tonnage on speculation, whereas others have short supplies as a bulwark against winter scrap demands.

Birmingham — Considerable movement of heavy melting scrap and most miscellaneous items is reported here. Cast grades continue scarce, but the situation generally is satisfactory as compared to a few weeks ago. Complaint on preparation is still heard in several quarters.

St. Louis — Steelmaking scrap prices eased here last week due to improvement in mills' inventories. No. 1 and No. 2 heavy melting steel scrap dropped 50 cents a ton while short shovel turnings dropped $1. A considerable number of high-priced orders expired Oct. 1 and some renewals have been delayed pending clarification of the price picture.

Seattle—The steel scrap situation looks more promising as the government is releasing a larger number of surplus ships, which under present circumstances is an important source of supply. The Kaiser organization is reported to be planning installation of a breaking plant at Swan Island and other interests on the Columbia river are expanding their facilities. Normal sources of supply are furnishing about the usual tonnage but normal scrap needs in this area are twice what they were in prewar days, accounting for the continued active demand since 1945.

Warehouse . . .

Warehouse Prices, Page 151

Cleveland—Warehouses were preparing to revise their prices upward last week in line with the interim increase in freight rates. Up to late last week no official announcements had been received from railroads or mills on which they could definitely base their new schedule. It was generally believed the increase in prices would be the net amount of the advance in transportation costs. As a complimentary factor, a change in trucking rates and, in some instances, in mill basing points on certain products was considered likely. The overall effect of the freight increase is expected to be a narrowing in the geographical market served to eliminate large absorptions of transportation costs and higher costs to consumers.

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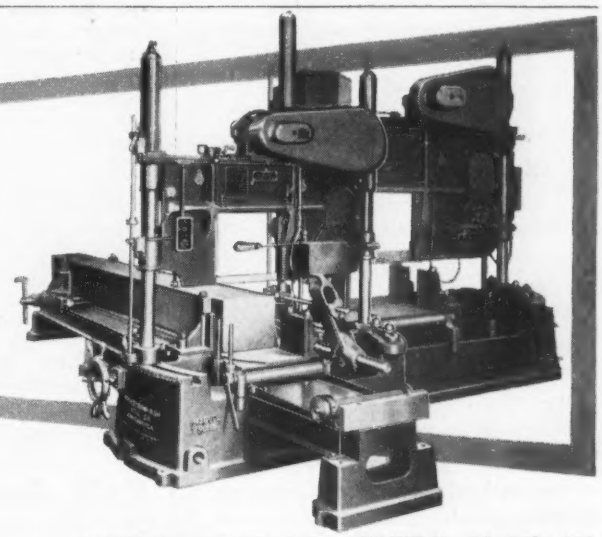

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district anticipate smaller receipts from mills during October, especially in the hard-to-get items, such as flat-rolled products, plates, shapes, and small hot-rolled bars. In some instances, the entire fourth quarter quota has been blanked out, tonnages shipped during that period being applied to unfilled business. Demand continues in excess of supply and pressure has increased from consumers whose quotas likewise have been reduced by the mills.

The recent tightening in supplies has stimulated activity in the "gray market" with recent sales in the Great Lakes territory including the following with shipments from Bayonne, N. J., which had been scheduled originally for export: 60 tons of galvanized sheets at $300 per ton and 27 tons of cold-rolled sheet at $280.

Boston—With fourth quarter warehouse quotas lower on most products for which consumer demand is heaviest, distributors are in no position to meet the heavy demand, although some progress has been made against old orders. Outlook for supply of flat-rolled products is not encouraging and shortages are expected indefinitely in these items. Of carbon products, only cold-finished bar stocks are sufficient to meet demand. Plates, structurals and pipe inventories are small and unbalanced.

Chicago—Warehouses are expected to revise their prices upward in the near future to offset the 10 per cent emergency increase granted to the railroads and effective Oct. 13. As of this date, steel reaching warehouses will be forced to assume the higher delivery charges, but it will be a few days before selling prices can be recalculated and new lists issued. Meanwhile, demand for all products, particularly flat rolled and small carbon bars, continues at an extremely high level. It is believed that the pending higher prices will have no effect in diminishing demand.

Cincinnati—Steel jobbers in this district have received announcement from some mills of cuts in October quotas which may run above 20 per cent. In one case, the announcement indicated no reinforcing bar quota would be set for this month. Demand already runs far ahead of supply in flat-rolled, small bars and structurals. In other items, the warehouse inventories are heavy enough to cushion the shock of mill cutbacks.

Rails, Cars . . .

Track Material Prices, Page 149

New York—Domestic freight car production in September amounted to a total of 7597 cars according to the American Railway Car Institute. This figure compares with 5963 in August and represents an increase of 154 per cent over January of this year.

In announcing the figures, S. M. Felton, president, declared: "The outlook for steel deliveries based on reports from car building plants is discouraging for the balance of this year and the first quarter of 1948. Unless there are increased shipments of steel the upward trend that has been consistent through the year will not be continued."

Domestic freight car awards last month amounted to 9917 cars, all placed with commercial shops. This compares with a revised total for August of 2372 cars, and brings the total for the first nine months up to 91,086, of which 73,901 were placed with commercial shops and 17,185 with railroad shops. The order backlog as of Oct. 1 amounted to 115,996 cars, of which 89,493 are under contract with railroad commercial shops and 26,503 with railroad shops. A comparative table covering freight car awards follows:

	*1947	*1946	1945	1944
Jan.	9,172	1,500	7,200	1,020
Feb.	13,727	2,403	1,750	13,240
March	12,049	4,512	2,500	6,510
April	8,836	3,764	1,120	4,519
May	7,390	3,025	1,526	1,952
June	†12,784	3,335	670	1,150
July	†14,840	14,836	3,500	795
Aug.	†2,372	9,629	7,240	3,900
Sept.	9,917	12,768	12,840	400
Oct.	.....	3,407	1,320	2,425
Nov.	.....	6,707	1,650	1,065
Dec.	.....	3,041	4,116	16,245
Total	.....	68,927	45,432	53,221

* American Railway Car Institute.
† Revised.

Pittsburgh—Carbuilders contend the steel supply outlook will make the monthly 10,000 freight construction goal impossible of attainment this year, despite reports from mills that steel distributed for this purpose has exceeded the monthly allotments held necessary earlier this year to meet the augmented freight car construction program. Most carbuilders have enough orders on their books to carry them through first half next year.

Canada . . .

Toronto, Ont.—Steel producers do not expect an equalizing in supply and demand before the middle of 1948 at the earliest, and the shortage may continue into 1949. While monthly quotas are running somewhat ahead of those prevailing earlier this year, steel deliveries to consumers are only about 75 per cent of actual requirements. In addition to domestic supply, Canada is importing approximately one-third of her steel requirements from the United States these will be reduced.
and there are no indications that

Demand for steel is steadily expanding and there have been increased inquiries recently from locomotive and railroad car builders as a result of the $16 million order for rolling stock placed by the Canadian Pacific Railway Co., involving 1,295 freight and express cars and 52 locomotives. A further order calling for 11 locomotives and 500 gondola cars costing $5,900,000, also will be placed by that carrier at an early date.

On steel sheets, demand is running well ahead of supply. Producers are booked solidly to the end of the year, and are not accepting 1949 commitments. Demand is equally heavy for both black and galvanized sheets.

Heavy orders for steel plate are reported and domestic plate makers report no surplus capacity to the yearend. To cope with the increasing demand, approximately 50 per cent of Canada's plate requirements are being filled through importation from the United States.

Demand for carbon steel bars is moving steadily ahead and, while

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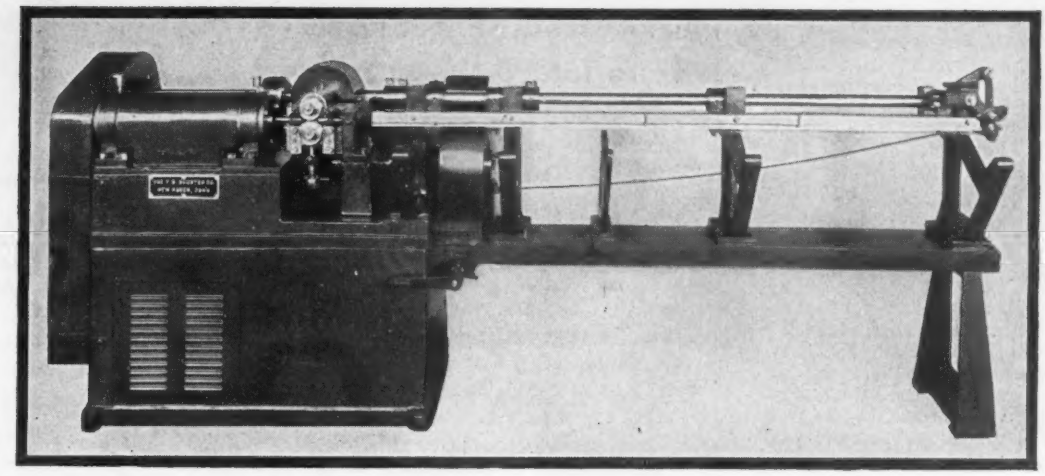

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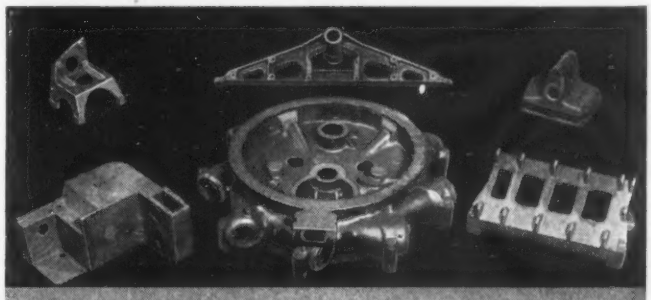

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producers endeavor to maintain commitments not exceeding two months' into the future, most mills are booked to the yearend. Some bar makers however, continue to accept orders for carbon bars on an if, as and when delivery basis, but are making no promise of shipments. Alloy bars also are in steady demand but domestic production is somewhat ahead of requirements.

Merchant pig iron sales are holding to approximately 8000 tons per week. While this total does not represent all of the demand, it is about the total domestic supply available to melters due to the fact that blast furnace operators are making use of a larger part of their output in steelmaking operations. Steel Co. of Canada is out of the market insofar as providing pig iron for merchant melters is concerned and Algoma Steel Corp. has cut its shipments on this account by about 10,000 tons per month. Canadian Furnace Co. continues to make available its output for the foundry melters.

Some minor improvement was noted recently in scrap receipts which may be partly due to the increased price which went into effect recently.

The new price on heavy melting steel delivered to consumers at Hamilton is now $22 per gross ton; mixed steel scrap, $19; bushelings, $17.50; short steel turnings, $17; remelting rails, $23; rerolling rails, $26 per ton, delivered consumer. No. 1 machinery cast is selling at $37 per gross ton, while some lots have been sold up as high as $40 per ton.

Tubular Goods Output for 1947 To Total 6 Million Tons

(*Concluded from Page* 57)

production," he pointed out.

"Prior to the war, trunk lines represented about 10 per cent of the total tubular production. However, upon cessation of hostilities, industrial requirements for gas and oil skyrocketed demand for pipe transmission lines, with the result that pipe mills, within a few months' time, booked orders for several years' production," Mr. McConnor explained.

A survey conducted early this year by National Tube, subsidiary of U. S. Steel Corp., to determine the amount of pipelines 20 in. and larger on order or were to be installed in the next five years by oil and gas companies revealed the aggregate amount per year is about 1,200,000 tons.

Prewar Production Exceeded—The total trunk line tonnage in all sizes, Mr. McConnor added, has been estimated by various people in the industry to represent a demand as high as 1,500,000 tons a year over the five-year period. In the prewar period, 1936-1940, the total trunk line tonnage for all sizes of pipe has been estimated at 260,000 tons a year. "While the steel industry has produced and is producing substantially more trunk line tonnage than in the prewar period, it cannot be expected to satisfy the unusual demand in the immediate future," he declared.

Additional pipe mill capacity requires large capital investment, Mr. McConnor pointed out, "and to be utilized under present circumstances would necessitate additional steelmaking facilities. Such facilities ordinarily could be justified only by a sustained, strong demand over a very long period." Completion would require two years or more, he pointed out. Most of the increased pipe mill capacity has been for trunk line output.

Shipments of oil country goods for 1947 are going forward at the rate of 1,300,000 tons a year, or 65 per cent in excess of the 790,000-ton yearly average, 1931-1940, Mr. McConnor reported at the annual meeting of the Independent Petroleum Association of America, at Oklahoma City, Okla., recently.

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STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1100 tons, power plant extension, Western Massachusetts Electric Co., West Springfield, Mass., to Steel Construction Division, Ingalls Iron Works Co., Birmingham; Stone & Webster Engineering Corp., Boston, contractor-engineer.

900 tons, warehouse, First National Stores, Portland, Me., to Bethlehem Steel Co., Bethlehem, Pa.; Thomas O'Connor Co., Cambridge, Mass., general contractor.

800 tons, housing project, American Community Homes, Forest Park, Ill., to Bethlehem Steel Co., Bethlehem, Pa.

300 tons, school, Edina, Minn., to United States Steel Supply Co., Minneapolis; M. Schumacher Co., Minneapolis, contractor.

290 tons, warehouse, General Motors Corp., Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

235 tons, warehouse, Holleb & Co., Chicago, to Joseph T. Ryerson & Son Inc., Chicago; A. Epstein, Chicago, engineer.

200 tons, spec. 1932, Phoenix, Ariz., and Earp, Calif., for Bureau of Reclamation, Denver, to Allison Steel Mfg. Co., Phoenix, Ariz.; bids Sept. 23.

120 tons, addition, Jack Steele Co., Philadelphia, to Bethlehem Fabricators, Bethlehem, Pa.

144 tons, sewage treatment plant, Tomah, Wis., to Joseph T. Ryerson & Son Inc., Chicago; Central States Engineering Co., Oshkosh, Wis., contractor.

100 tons, local theater building and other projects, Seattle, to Isaacson Iron Works, Seattle.

STRUCTURAL STEEL PENDING

1500 tons, hangars, Southwest airport, Philadelphia; Hughes Folkrod Co., that city, low on general contract.

600 tons, New Jersey state overpass, Newark, N. J.; bids Oct. 21.

211 tons, bridge, sec. 58F and 58V-P, Warrenville, Ill., for State Highway Division; bids of Sept. 12 rejected; new bids, Oct. 10.

170 tons, lead dross building, American Smelting & Refining Co., Hammond, Ind.; bids Sept. 25.

150 tons, Pennsylvania state bridge, Bedford county; bids Oct. 24.

150 tons, also 25 tons reinforcing, public roads bridge, Boise national forest; bids to Boise, Oct. 14.

142 tons, bridge, sec. DX-SS, Nilwood, Ill., for

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State Highway Division; bids of Sept. 12 rejected; new bids Oct. 10.

REINFORCING BARS . . .

REINFORCING BARS PLACED

215 tons, state bridge, school and auto testing station, Seattle, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

900 tons, Port of Seattle Bow Lake airport administration building; Lease & Leighland, Seattle, low $2,190,025.

271 tons, Natural Resources building, University of Illinois, Urbana, Ill.; Kuehne-Simmons Co., Rantoul, Ill., low on general contract; bids Sept. 30.

170 tons, Edison vocational school, Seattle; Wick & Dahlgren, Seattle, low, $369,861.

135 tons, two reclamation projects, Owyhee and Madras, Oregon; bids Oct. 15 and 24, respectively.

104 tons, substructure, stage 1, N. State St. viaduct, Department of Public Works, Chicago; Thomas McQueen Co., Forest Park, Ill., low on general contract; bids Oct. 2.

PLATES . . .

PLATES PLACED

150 tons, 12 inch steel pipe for Hanford, Wash., housing project, to Hydraulic Supply Mfg. Co., Seattle.

PLATES PENDING

250 tons, 9,000 ft. 20 inch water pipe, Walla Walla, Wash.; bids in.

Unstated, 150,000-gal. elevated steel tank for Hungry Horse camp, Montana; bids in to Bureau of Reclamation, Denver.

PIPE . . .

STEEL PIPE PENDING

335 tons, 36-inch steel water pipe, Benton Harbor, Mich.; Great Lakes Dredge & Dock Co., Chicago, sole bidder on general contract, bids Sept. 26; bid rejected.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atlanta & West Point, 20 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Birmingham Southern, 128 seventy-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Chesapeake & Ohio, 1650 freight cars, placed as follows: 1000 gondola cars to Pressed Steel Car Co., Pittsburgh; 500 covered hopper cars to Ralston Steel Car Co., Columbus, O.; and 150 thirty-ton caboose cars to American Car & Foundry Co., New York.

Chicago, Burlington & Quincy, 150 seventy-ton covered cars, to its own shops at Lincoln, Nebr.

The Georgia, 75 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Gulf, Mobile & Ohio, 50 seventy-ton mill type gondolas, to Pressed Steel Car Co., Pittsburgh.

Norfolk & Western, 2000 seventy-ton hopper cars, to own shops at Roanoke, Va.

Seaboard Air Line, 400 fifty-ton gondolas, to the American Car & Foundry Co., New York, for construction at Berwick, Pa.; 300 of the gondolas will be of high side and 100 of low side construction.

Western of Alabama, 30 fifty-ton hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

LOCOMOTIVES PLACED

Elgin, Joliet & Eastern, twenty-five 2000-horsepower Diesel-electric transfer locomotives, to Baldwin Locomotive Works, Eddystone, Pa.

Spokane, Portland & Seattle, three 1000-horsepower Diesel-electric switch engines, to the Electro Motive Division, General Motors Corp., La Grange, Ill.

CONSTRUCTION AND ENTERPRISE

CALIFORNIA

LOS ANGELES—Aluminum Container Corp. has been formed by Joseph H. Collins and associates with a capital of $200,000 to manufacture, deal and sell aluminum, iron, steel and other materials. Firm is represented by Dechter, Hoyt, Fines & Walsh, 635 Subway Terminal Bldg.

POMONA, CALIF.—Oliver Pump Co. has been incorporated by Roland B. Sprich and associates with a capital of $2 million. Firm is represented by Allard, Brownsberger & Shelton, First National Bank Bldg.

SAN FRANCISCO—Magna Mfg. Co. has been incorporated with a capital of $50,000 by Hans Goldschmidt and associates to manufacture lathes, circular saws, bandsaws, jig saws, drill presses, shapers and sanders. Firm is represented by Robert L. Chambers, 360 Ringwood, Menlo Park.

SAN FRANCISCO—Cresta Bros., 5098 Mission St., plans to build a 2-story auto parts plant to cost $150,000. Architect is Mario Ciampi, 333 Kearney St.

SAN FRANCISCO—Glidden Co., 1300 Seventh Ave., has awarded a $55,000 contract to E. S. McKittrick Co., 610 16th St., Oakland, for construction of storage tank facilities. Engineer is Clyde E. Bentley, 408 Sansome St.

ILLINOIS

CHICAGO—Robinson Steel Warehouse Co., 440 S. Winchester St., has awarded a general contract to Poirot Construction Co., 2011 W. Pershing Rd., for erection of a warehouse. Total cost is estimated at $150,000. Engineers are A. Epstein & Sons, 2011 W. Pershing Rd.

INDIANA

SYRACUSE, IND. — Liberty Coach Co. has abandoned a project to build a $100,000 factory.

MICHIGAN

DETROIT—Dalzen Tool & Mfg. Co., 12255 E. Eight Mile Rd., proposes to build a $210,000 motor parts factory.

MINNESOTA

HASTINGS, MINN.—Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, plans to build a $1,750,000 plant project near here which will include two buildings.

MINNEAPOLIS — Scott-Atwater Mfg. Co., 2901 E. Hennepin Ave. has let a general contract to C. O. Field Co., 2940 Harriet Ave., for construction of a 1-story factory and warehouse addition to cost $80,000. Architects are Jacobsen & Jacobsen, 623 Sexton Bldg.

ST. CLOUD, MINN. — Franklin Transformer Mfg. Co., 32 Cooper Ave., has awarded a $200,000 contract to Pearson Bros., 2202 Bryant Ave., Minneapolis, for the construction of a factory addition. Architect is J. E. Mills, 117 Bates Ave., St. Paul.

MISSOURI

ST. LOUIS—Union Electric Co., 315 N. 12th St., has let a contract to Fruin-Colnon Construction Co., 1706 Olive St., to modernize a steam plant at an estimated cost of $730,000. Architect is Day & Zimmermann Inc., Philadelphia.

ST. LOUIS — Mallinckrodt Chemical Works, 3600 N. Second St., has let a $70,000 contract to Dickie Construction Co., 317 N. 11th St., for the erection of a 3-story boiler plant addition at 200 Mallinckrodt St. Engineers are Jackson & Moreland, Boston.

ST. LOUIS—Monsanto Chemical Co., 1700 S. Second St., has awarded a contract to I. E. Millstone Construction Co., 4343 Clayton Ave., for the erection of a $250,000 steam power generating plant at 136 Lesperance St.

NEW JERSEY

NEWARK, N. J.—Federated Metals Co., 150 St. Charles St., plans to build a $100,000 plant. Engineer is J. M. Bateman, 150 St. Charles St.

NEWARK, N. J.—Atlantic Refining Co., 260 S. Broad St., Philadelphia, has awarded contracts totaling $954,000 to J. Rich Steers Inc., 17 Battery Point, New York, for the construction of two storage plants here. Engineer is L. M. Goldsmith, 260 S. Broad St., Philadelphia.

NEW MEXICO

FARMINGTON, N. MEX.—El Paso Natural Gas Co., Bassett Tower, El Paso, Tex., plans to build a $400,000 booster station here for a 26-in. natural gas line.

NEW YORK

MT. VERNON, N .Y.—Commercial Decal Inc., A. C. Sias, vice president, 445 S. Tenth Ave., has awarded a general contract to Cuzzi Bros. & Singer, S. Third Ave. and Seventh St., for site preparation, foundation and superstructure for a plant. Steel has been awarded to Harris Structural Steel Co., 419 Fourth Ave., New York. Total cost is estimated at $750,000.

OLEAN, N. Y.—Clark Bros. Co., subsidiary of Dresser Industries Inc., has announced plans for a $225,000 expansion project to include an assembly building, foundry addition and office building addition.

YONKERS, N. Y.—Pyridium Corp., Nepera Park, has awarded a $60,000 contract to A. Barbaresi & Sons Inc., 10 Fisk Pl., Mt. Vernon, for construction of a 2-story laboratory. Architect is Fletcher Thompson Inc., 211 State St., Bridgeport, Conn.

OHIO

DEFIANCE, O.—General Motors Corp., Central Foundry Division, Detroit, has awarded a $500,000 contract to Spence Bros., 201 Brewer Arcade, Saginaw, Mich., for construction of a 1-story foundry here.

WARREN, O.—Air Reduction Sales Co., Thomas Rd., which recently suffered fire damages here estimated at $250,000, is having plans drawn for reconstruction. Limited production and a temporary field setup have been started, in the meantime, at the plant.

OKLAHOMA

HOOKER, OKLA.—Harrington & Marsh, Amarillo, Tex., has awarded a $1,500,000 contract to J. F. Pritchard & Co., Fidelity Bldg., Kansas City, Mo., for design and construction of a natural gas processing plant.

VELMA, OKLA.—Skelly Oil Co., Skelly Bldg., Tulsa, has awarded a $7 million contract to Born Engineering Co., Admiral Blvd., Tulsa, for construction of a natural gasoline plant here and a pipeline system in Oklahoma.

OREGON

PORTLAND, OREG. — Transport Bodies & Equipment, St. Helens Rd., has awarded a $75,000 contract to A. E. Stebinger, 927 Water St., for construction of a factory and office. Architect is Sidney P. Lathrop & Associates, Swetland Bldg.

PENNSYLVANIA

CHARLEROI, PA.—Peoples Natural Gas Co., 545 William Penn Way, Pittsburgh, has awarded a $55,000 contract to Fish Engineering Corp., 104 M & M Bldg., Houston, Tex., for two buildings.

HAYS, PA. — Harbison Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, plans to spend about $55,000 on a proposed research laboratory addition here. Architect is G. R. Black, Crogan Bldg., Pittsburgh.

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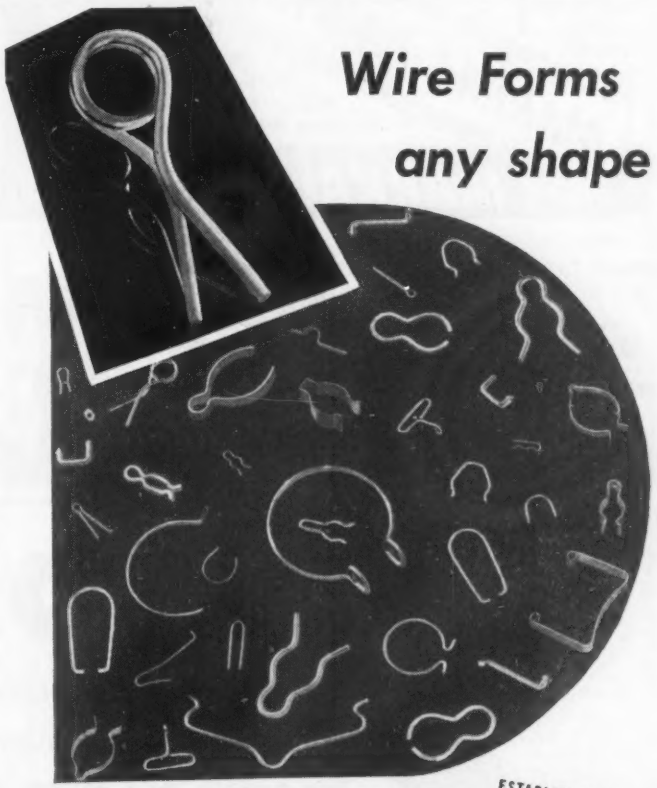

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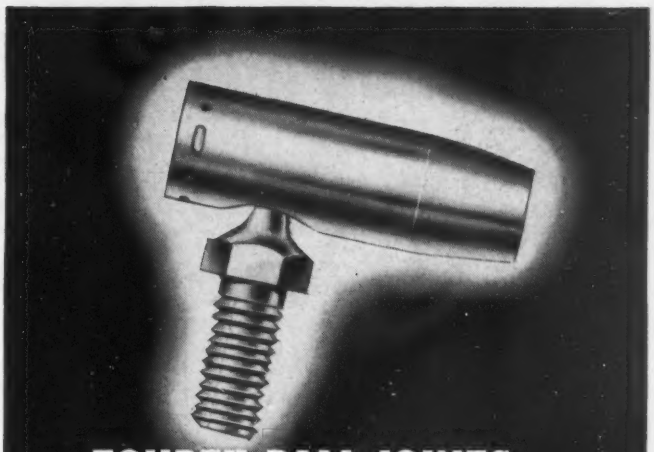

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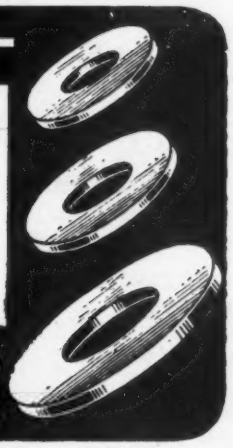

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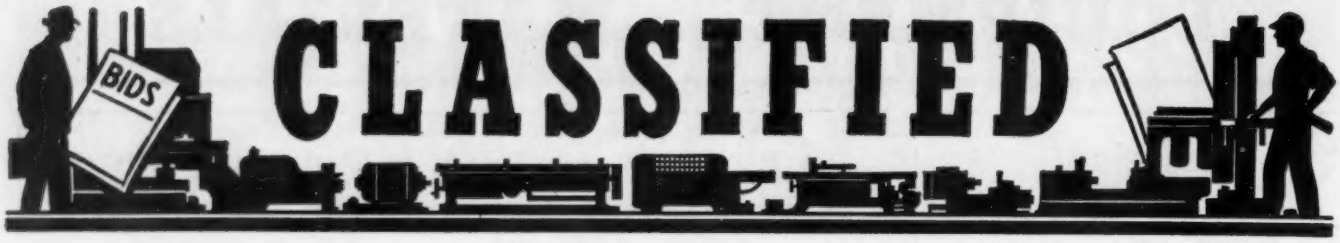

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Statement of the ownership, management, circulation, etc., required by the Act of Congress of Aug. 24, 1912 and March 3, 1933, of STEEL, published weekly at Cleveland, O., for Oct. 1, 1947, State of Ohio, county of Cuyahoga, ss. Before me, a notary public in and for the state and county aforesaid, personally appeared Geo. O. Hays, who, having been duly sworn according to law, deposes and says that he is the Business Manager of STEEL, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of Aug. 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal laws and regulations, to wit: 1.—That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The Penton Publishing Co., 1213 West Third St., Cleveland 13, Ohio. Editor, Irwin H. Such, 1213 West Third St., Cleveland 13, Ohio. Managing Editor, None. Business Manager. Geo. O. Hays, 1213 West Third St., Cleveland 13, Ohio. 2.—That the owner is The Penton Publishing Company, Cleveland, Ohio. Names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock: Edwin C. Barringer, Washington, D. C.; Samuel E. Bool, Cleveland, Ohio; Richard M. Bourne, Cleveland, Ohio; County National Bank of Santa Barbara, Santa Barbara, Calif.; J. R. Dawley, Cleveland, Ohio; Ernest C. Dempsey, Richard Inglis & Central National Bank of Cleveland as Trustees under agreement with John A. Penton dated Feb. 16, 1924, Cleveland, Ohio; The Fanner Manufacturing Co., Cleveland, Ohio; Agnes T. Hays, Cleveland, Ohio; George O. Hays, Cleveland, Ohio; Russell C. Jaenke, Cleveland, Ohio; S. H. Jasper, Pittsburgh, Pa.; A. L. Klingeman, Cleveland, Ohio; E. C. Kreutzberg, Washington, D. C.; Parness & Co., Cleveland, Ohio; J. D. Pease, Mount Dora, Florida; L. E. Penton, Los Angeles, Calif.; E. L. Shaner, Cleveland, Ohio; Charles J. Stark, Cleveland, Ohio; Penelope M. Stark, Cleveland, Ohio; E. L. Werner, Cleveland, Ohio; Grace Whelan, Santa Barbara, Calif. 3.—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None. 4.—That the two paragraphs next above, giving the names of the owners, stockholders and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. 5.—That the average number of copies of each issue of this publication sold or distributed through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is 13,382. Geo. O. Hays. Sworn to and subscribed before me this 30th day of September, 1947. (Seal) R. W. Coleman. (My commission expires Dec. 26, 1947.)

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As the white outline indicates, a standard unit of much greater frame size would be required to do the work of Speedaire.

Floods of suds don't disturb SPEEDAIRE

THIS Speedaire drives a stock chest agitator in a paper mill. The two airducts or ventilators on the motor protect it against drenching during the daily washdown with water. Foam from stock and black liquor, which sometimes builds up as high as 8 or 10 feet during starting, is no handicap to Speedaire, as its efficiency is unaffected by either moisture or dust.

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Send for Catalog 300 for a full description. The Cleveland Worm & Gear Co., 3270 E. 80th St., Cleveland 4, O.

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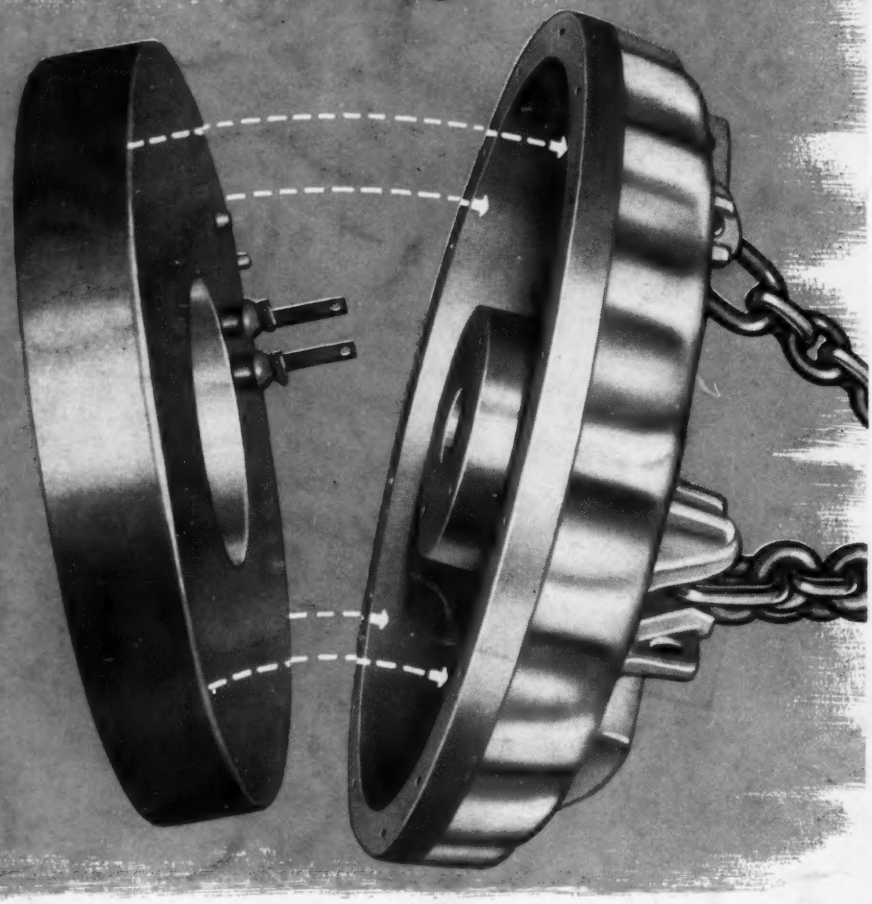

Now! New anti-wear features prolong chain life

Cutler-Hammer Supermagnets now embody a new welded, steel-sheathed CAPSULE-COIL sealed against moisture. With this new design plus removable pole shoes *YOU CAN REPLACE A COIL* easily, quickly and with a minimum of "time-out". For coil repairs, only the CAPSULE-COIL need be returned to the manufacturer. With a spare CAPSULE-COIL replacement, your Supermagnet goes back to work at once.

Also NEW, a radically different chain suspension, replacing the conventional top link with a new "non-twist", anti-wear yoke. This, plus redesigned, streamlined body lugs, materially eliminates trouble at the spots where chain usually wears out.

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